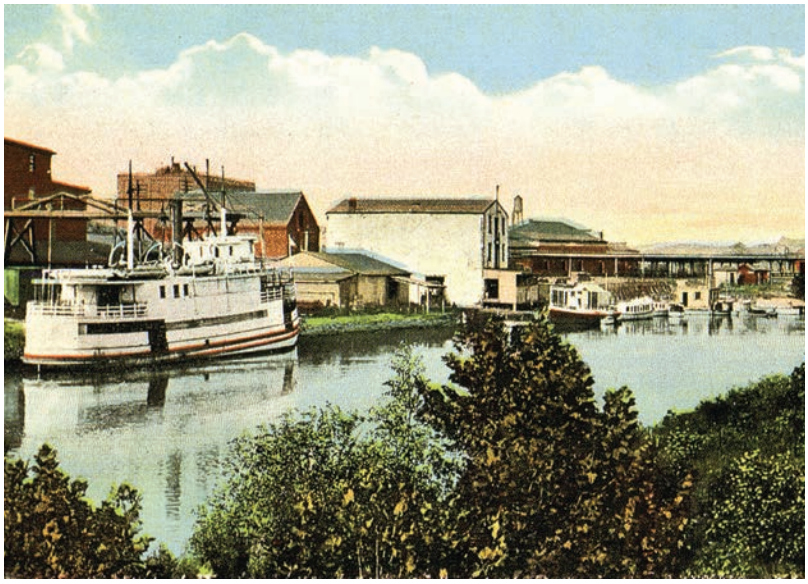
# WAUKESHAW

## The Harbor

Former Petersburg Harbor Transformed for Festivals

### History - Petersburg Harbor



Petersburg Harbor, situated on the Appomattox River, played a vital role in the settlement and development of the city. The presence of the river falls marked the furthest point upriver accessible to waterborne transportation, making it an ideal location for trade beginning in the mid-1600s. Oceangoing ships docked at Petersburg harbor, carrying cargo from surrounding regions, primarily local tobacco.

The Petersburg Harbor continued to thrive well into the 1930s, boasting factories, wharves, barges, and leisure craft. These activities added vitality to the harbor's operations.

Little physical evidence remains today to reflect the once-bustling commercial activity that centered around Petersburg's harbor. The harbor's strategic position and access to waterborne transportation played a pivotal role in shaping Petersburg's development and economic growth for over three centuries.

### The Harbor - A Thriving Economic Destination

Waukeshaw sees big opportunities in this undeveloped stretch of land at the edge of Old Towne Petersburg. Without any sizeable outdoor venue for festivals or community events, Petersburg has historically been overlooked by musical acts and festival organizers. Waukeshaw is working with local stakeholders to reposition The Harbor as an attractive venue for Petersburg and Southside Virginia.

> We like to find opportunity in quirky places. Places that other people aren't paying that much attention to, but obviously have a lot of potential.
>
> Dave McCormack
> President, Waukeshaw

This event and festival space will play a significant role in enhancing the vitality and cultural fabric of Petersburg and Central Virginia. Bringing communities together, fostering a sense of unity, and promoting local pride will grow the economy, and attract visitors who spend money on accommodations, dining, shopping, and other services, thereby supporting Petersburg businesses.

The Harbor will contribute to the preservation and promotion of cultural heritage and diversity. It will become a platform for local artists, performers, and creators to showcase their talents and traditions, enriching the community's cultural landscape. Additionally, this venue will position Petersburg as a tourist destination, drawing thousands of visitors who are interested in experiencing cultural offerings and generating additional revenue.


Traffic Impact Analysis

# Harbor Redevelopment

Petersburg, Virginia

**September 2022**


**Prepared for:**
Waukeshaw Development, Inc.
245 E. Bank Street
Petersburg, Virginia 23802

GOROVE SLADE
Transportation Planners and Engineers

# Introduction

Waukeshaw Development, Inc. is proposing to establish a festival / special event site on property they own on the north side of River Street / Joseph Jenkins Roberts Street across from 3rd Street. They envision holding several events throughout the year, such as concerts, wine festivals, and fireworks shows. As part of the development plan, they are proposing to remove River Street between 3rd Street and 5th Street to make the property more suitable for events. This Traffic Impact Analysis (TIA) is based on our meeting with the City on July 14.

We are assuming the largest events will draw approximately 2,500 people, but most events will be much smaller. To be conservative, we analyzed the traffic impact of 2,500 people leaving the site on a Saturday evening at approximately 10:00 PM after a concert or fireworks show.

Assuming an average occupancy of 2.5 people per vehicle, we expect approximately 1,000 vehicles to be parked near the site for the largest events. The team has identified four large parking areas that can be used:

- Grass / gravel lot on the west side of Sapony Street
- Grass / gravel lot between Joseph Jenkins Roberts Street and the U.S. 301 overpass
- Asphalt lot on the north side of River Street west of U.S. 301
- Paved lots on both sides of Bank Street between N. Sycamore Street and U.S. 301

These four lots combined have a capacity of approximately 1,160 spaces, which will accommodate even the largest events. Many people will also choose to parallel park on the streets in the area.

## *Scope of the Traffic Analysis*

Based on our traffic study scope meeting with the City on July 14, the study area includes the following intersections:

- U.S. 301 at Bridge Street
- Bollingbrook Street at 3rd Street
- River Street at 3rd Street
- River Street at Joseph Jenkins Roberts Street

Figure 1 shows the site location and study intersections.


**Figure 1: Site Location and Study Intersections**

## Existing (2022) Conditions

### *Existing Roadway Network*

U.S. 301 (Boulevard) is a four-lane Principal Arterial with a current average daily traffic (ADT) volume of 15,000 vehicles per day (vpd) and a posted speed limit of 25 mph.

Bollingbrook Street is a two-lane Minor Arterial with a current ADT volume of 4,100 vpd and an unposted speed limit.

3rd Street is a two-lane Major Collector with a current ADT volume of 410 vpd and an unposted speed limit.

River Street is a two-lane roadway that includes segments that are classified as Minor Collector and Major Collector with a current ADT volume of 200 vpd and a posted speed limit of 25 mph.

The existing lane configuration is shown in Figure 2.

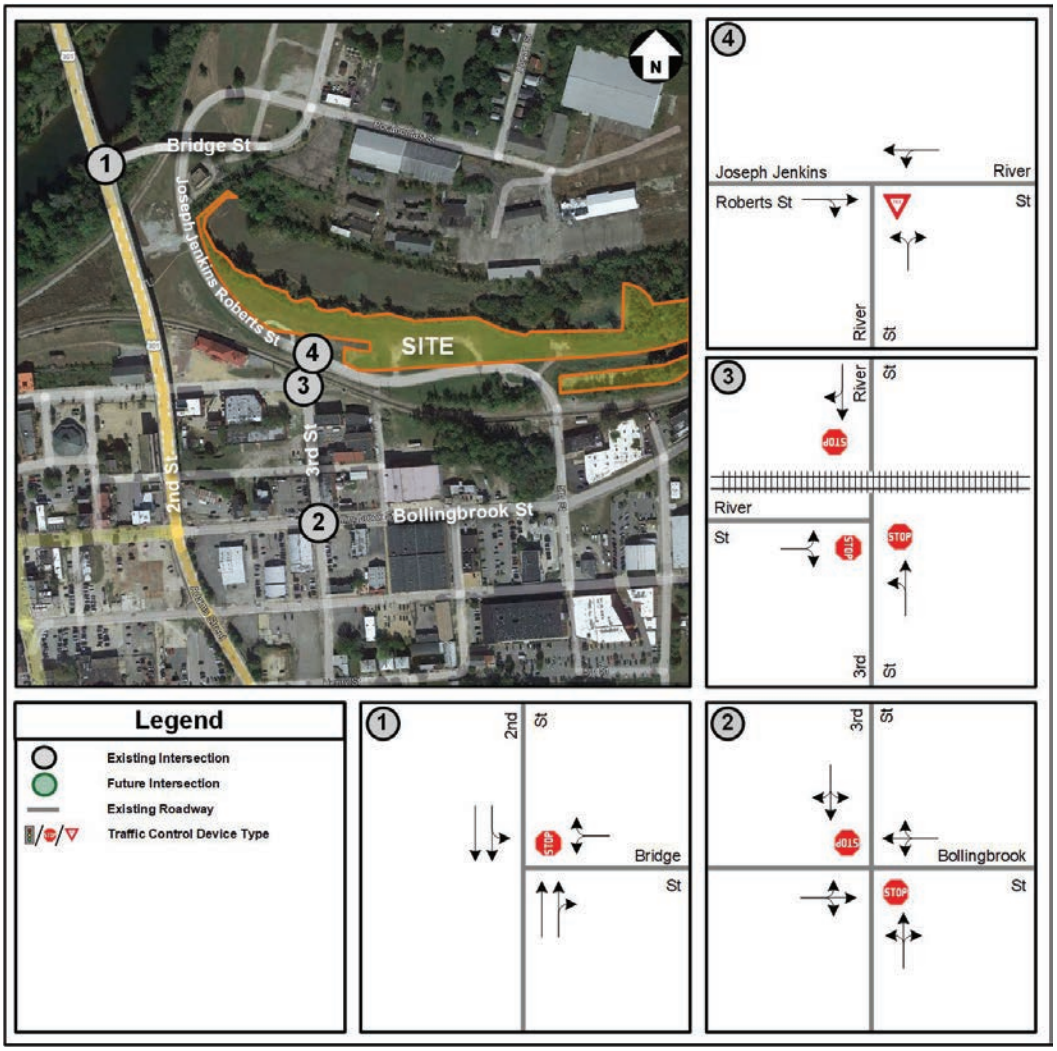



**Figure 2: Existing Lane Configuration**

### *Existing Pedestrian and Bicycle Accommodations*

There are currently no bus stops of bicycle lanes in the vicinity of the site. Sidewalks are present along all roadways in the study area except Joseph Jenkins Roberts Road.

### *Existing (2022) Traffic Volumes*

Turning movement counts for the Saturday evening peak hour (9:30 to 11:30 PM) were conducted by Burns Services, Inc. on June 30, 2022 at the following intersections:

- U.S. 301 at Bridge Street
- Bollingbrook Street at 3rd Street
- 3rd Street at River Street
- Joseph Jenkins Roberts Street at River Street

The existing Saturday evening peak hour volumes are shown in Figure 3.

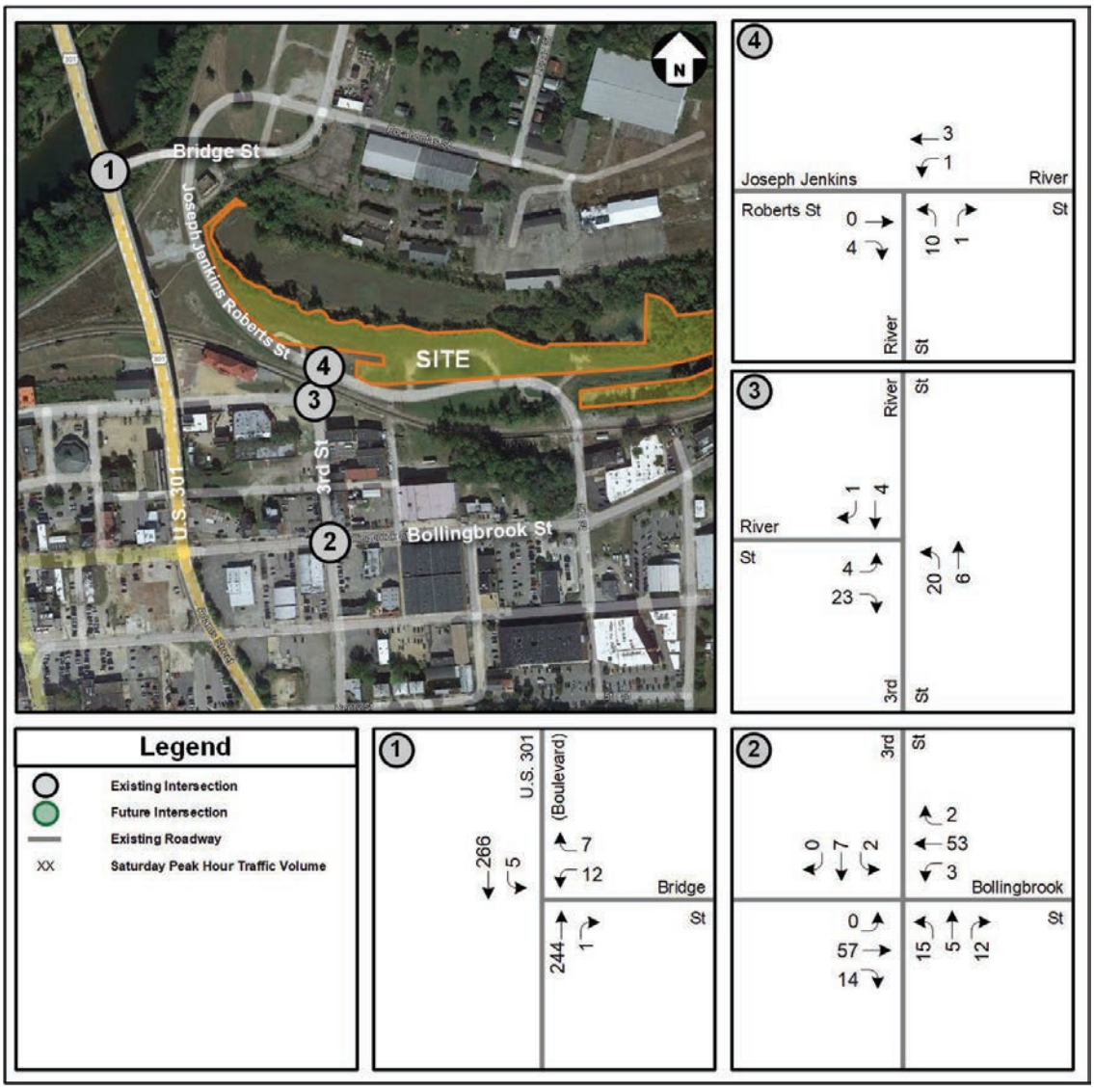



**Figure 3: Existing 2022 Saturday Evening Peak Hour Traffic Volumes**

## Build (2025) Conditions

### *Regional Growth*

To be conservative, the existing traffic volumes were increased by 1.0% per year for three years to estimate the projected 2025 traffic volumes.

### *Event Trips*

Since the festival space will be used for a variety of events, the site generated trips were considered based on the available parking spaces associated with the site. Figure 4 shows the four large parking areas that will be used for large events.

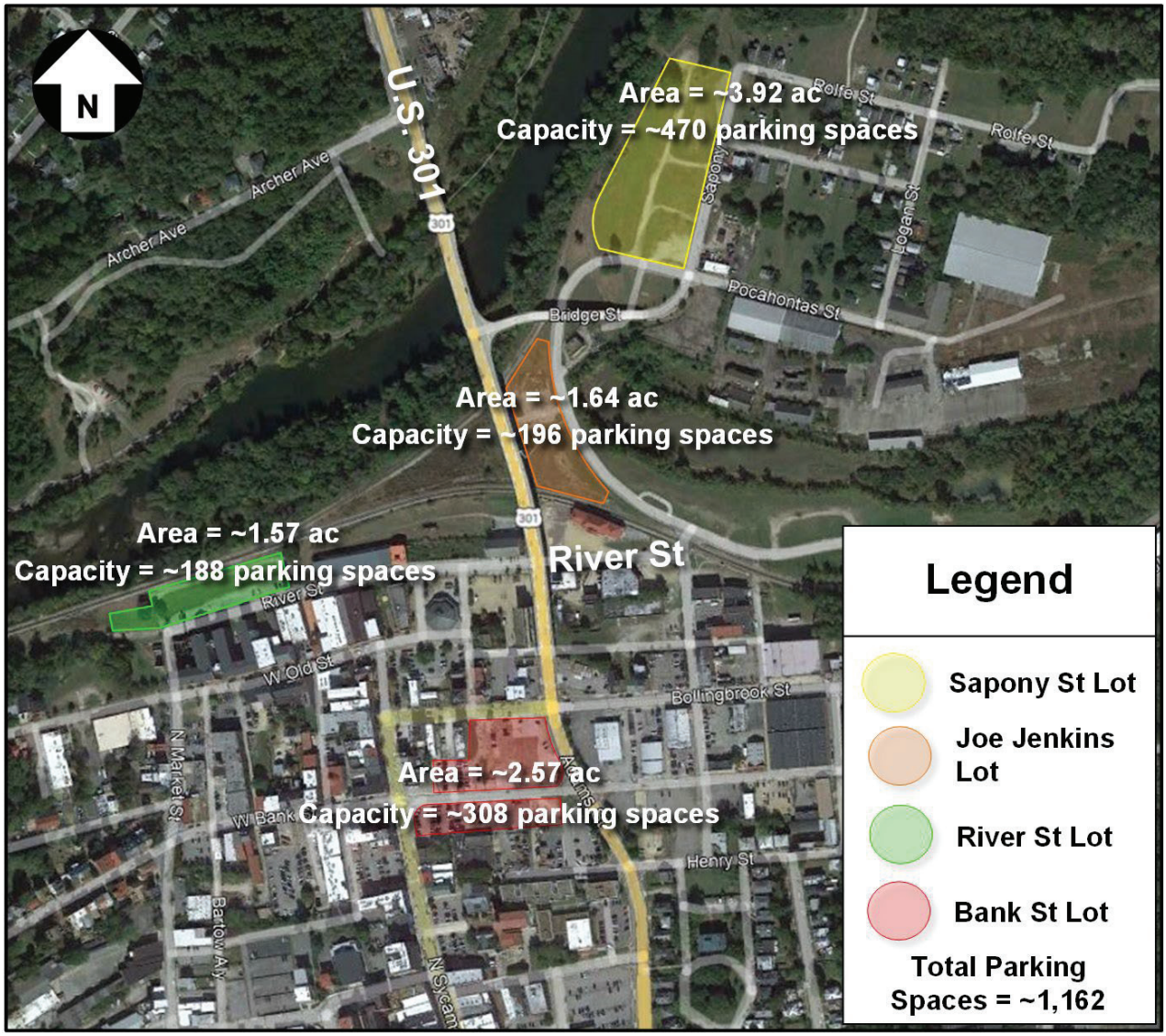



**Figure 4: Parking Areas and Capacities**

Each parking area was evaluated on a conceptual level to determine an approximate amount of parking spaces that would be available in each section. It was assumed that one acre can accommodate approximately 120 parked vehicles.

### *Event Traffic Distribution*

For the purposes of this analysis, only the outbound trips were included in the analysis. Patrons are expected to arrive in a staggered manner, however once the event ends, it is assumed that all patrons will attempt to leave around the same time.

Then, each area was given a separate trip distribution to disperse the vehicles throughout downtown based on Google Map directions and some engineering judgement accounting for potential alternate routes through the grid network. In order to create a more comprehensive depiction of the site trips, the exiting vehicle pathways are included in the Appendix. The trip distributions for Areas 1 – 4 are shown in Figure 5 through Figure 6. The trip assignments are shown in Figure 9 through Figure 12. The total trips are shown in Figure 13.

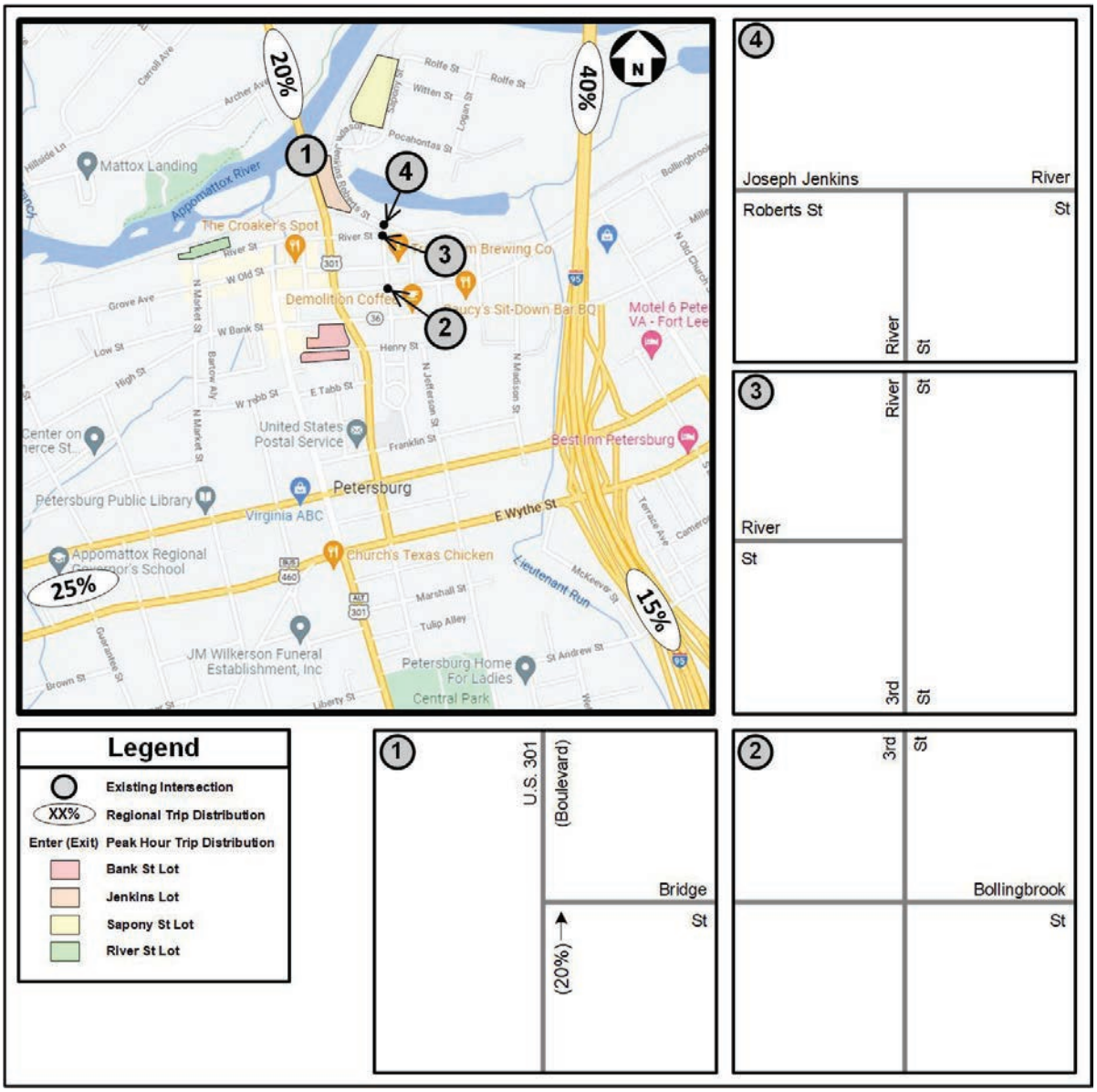



**Figure 5: Bank Street Lot Vehicle Distribution**

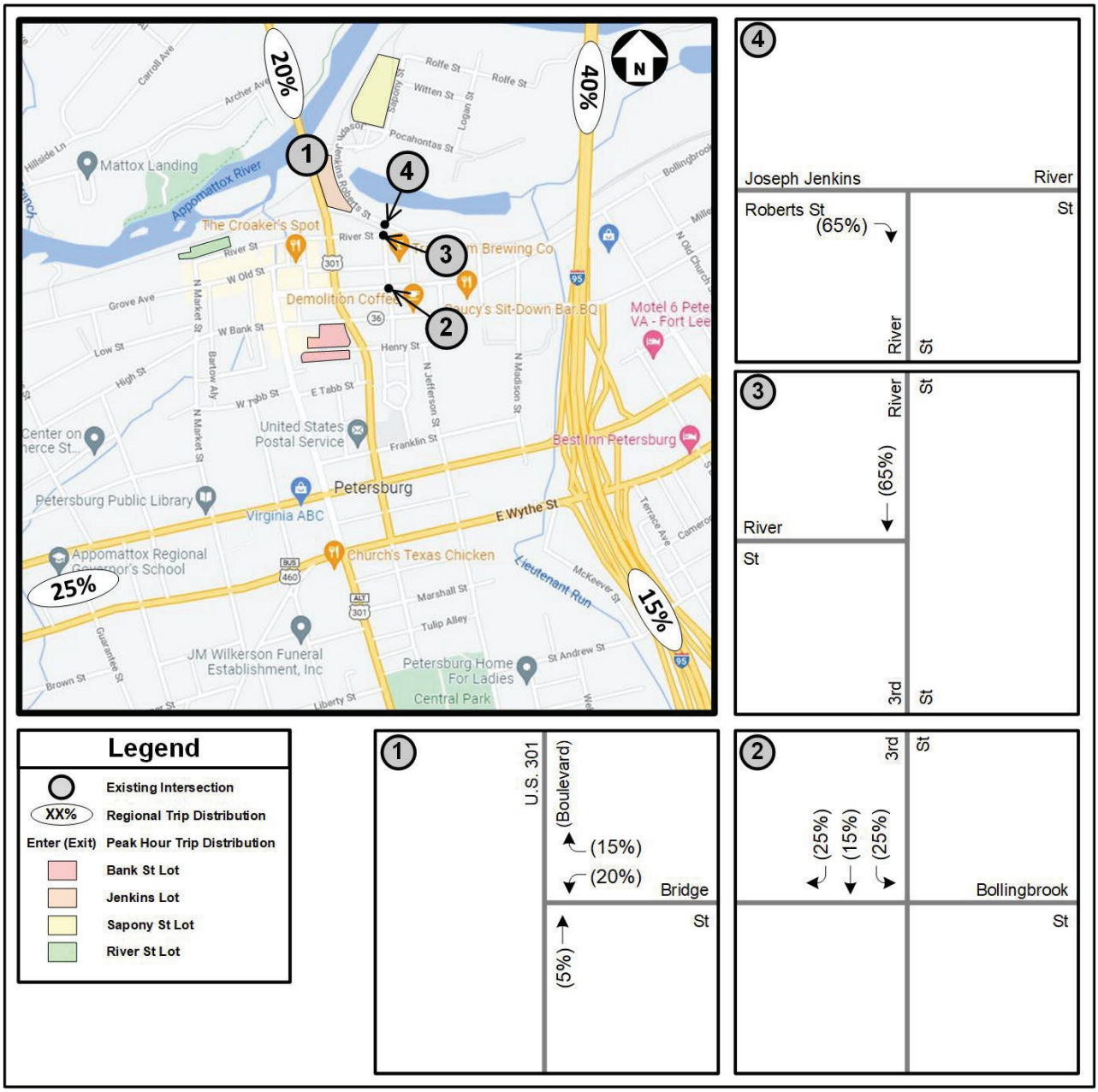



**Figure 6: Joseph Jenkins Roberts Street Lot Vehicle Distribution**

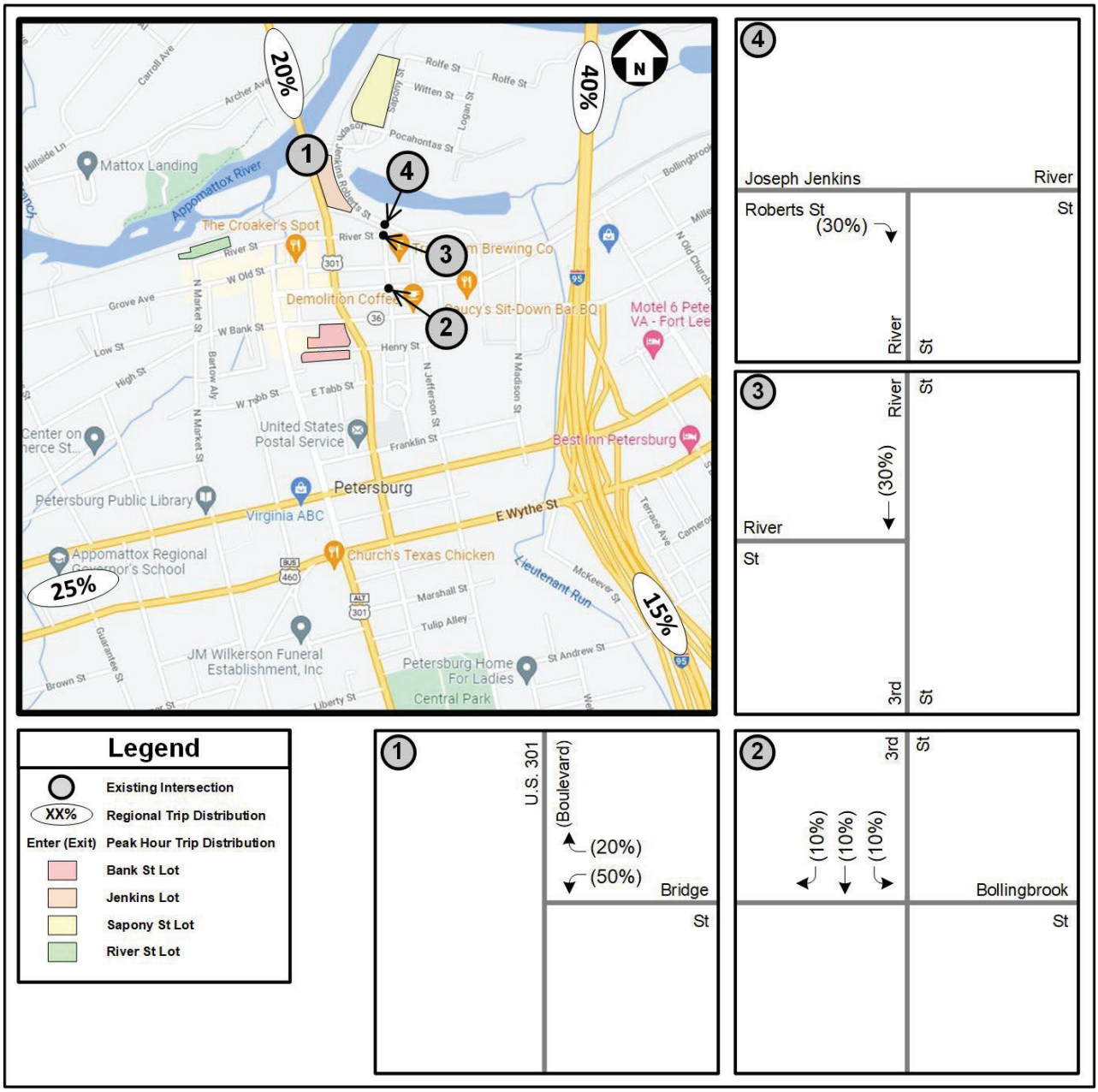



**Figure 7: Sapony Street Lot Vehicle Distribution**

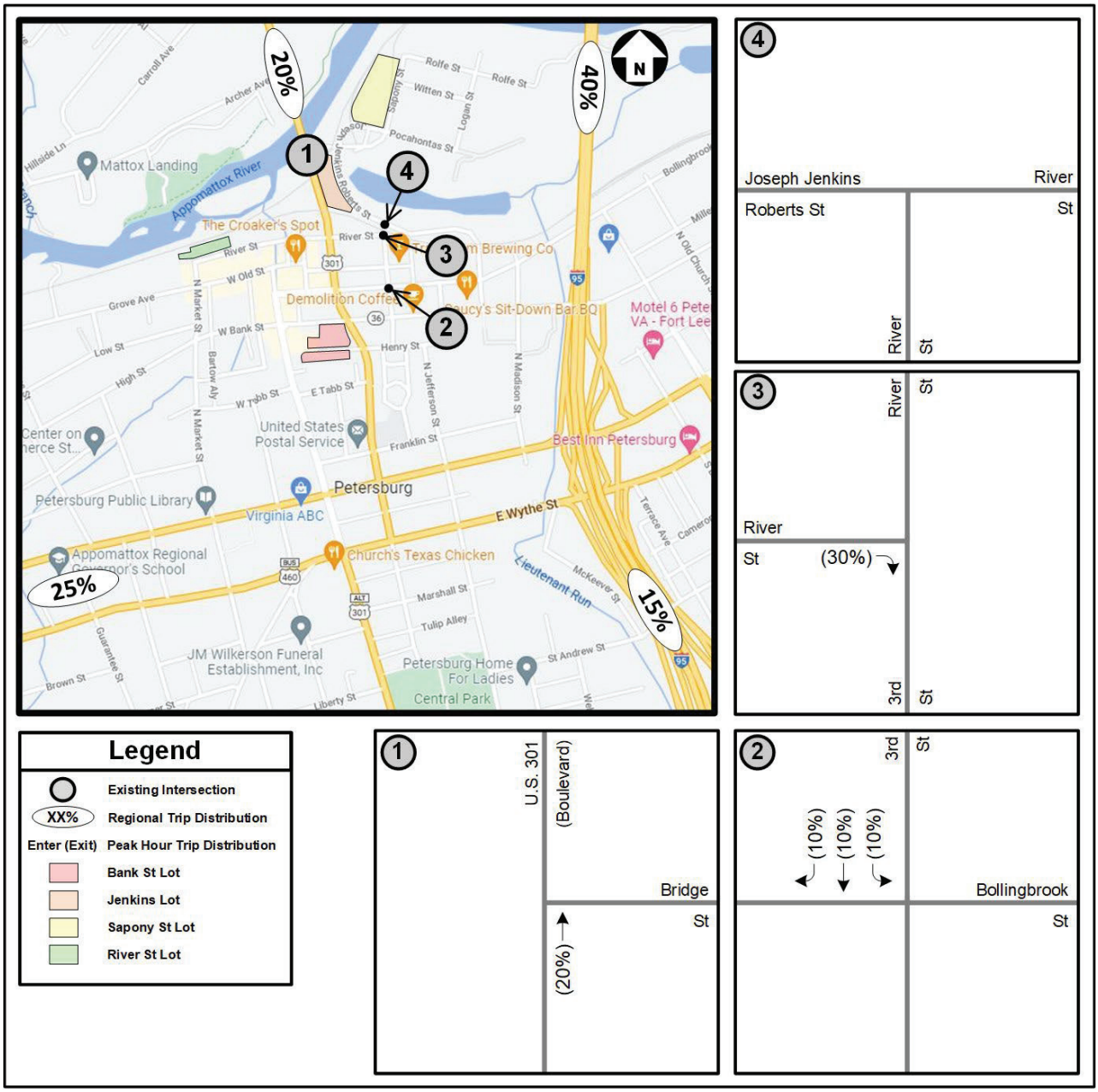



**Figure 8: River Street Lot Vehicle Distribution**

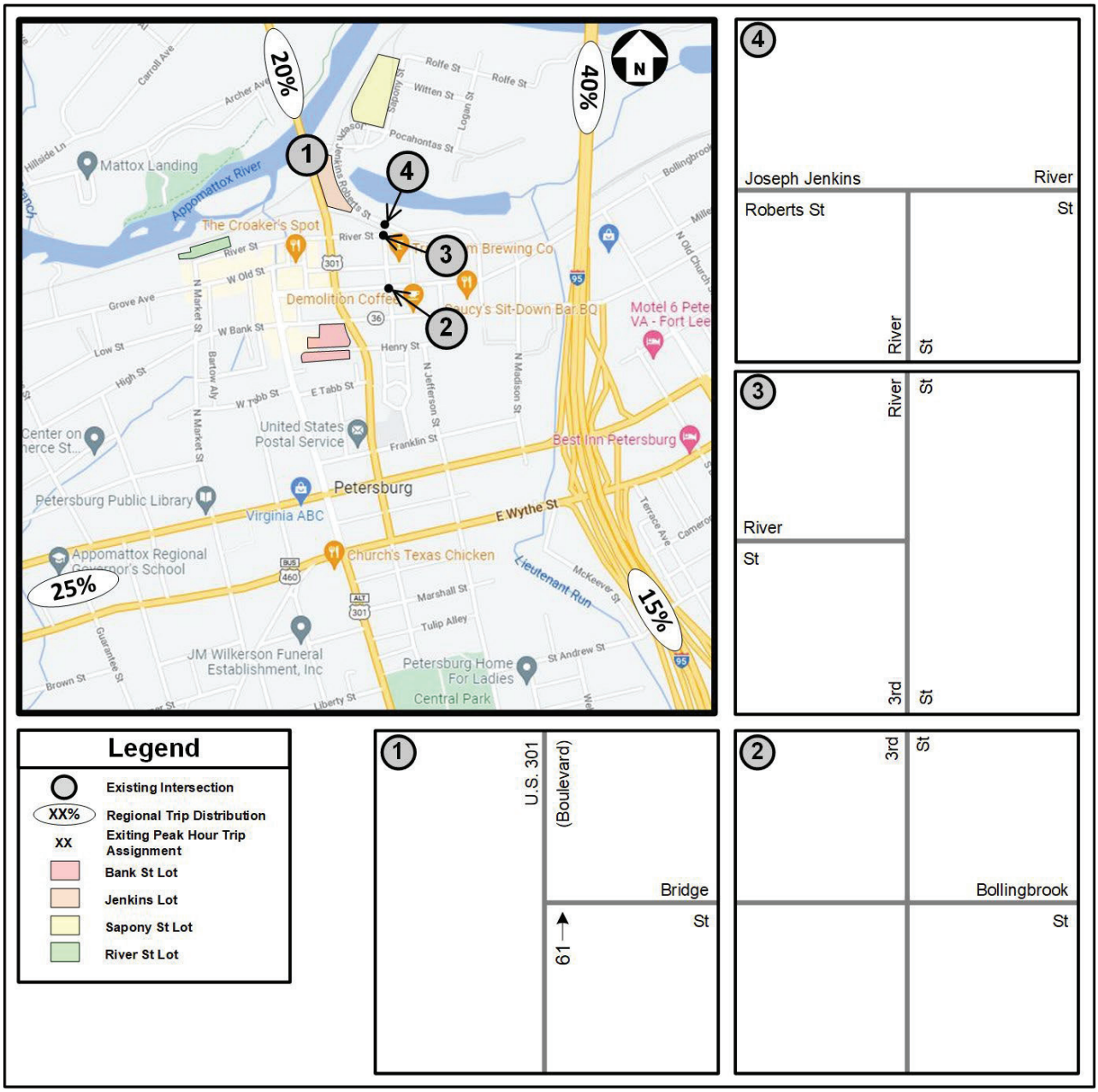



**Figure 9: Bank Street Lot Vehicle Assignment**

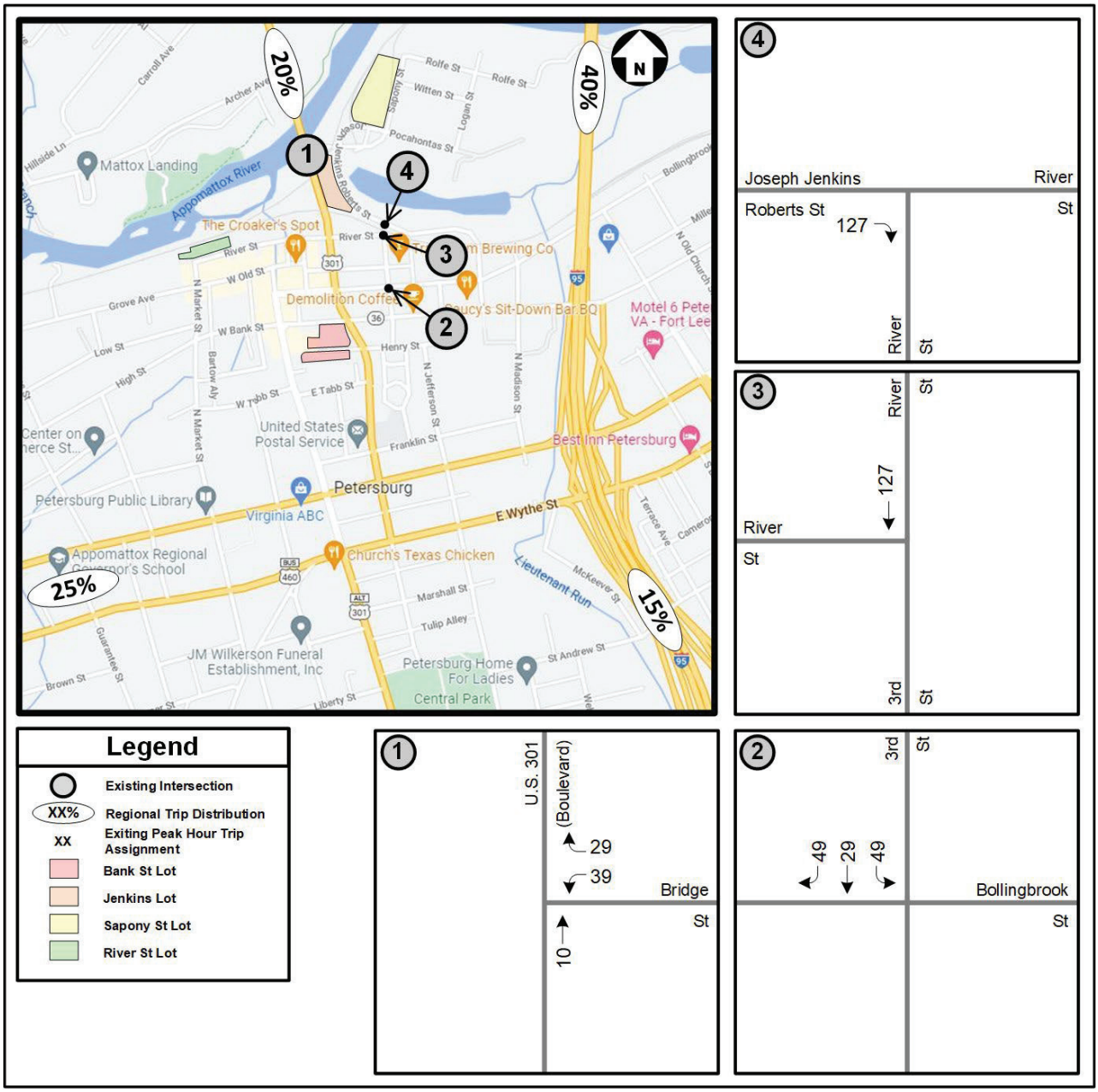



**Figure 10: Joseph Jenkins Roberts Street Lot Vehicle Assignment**

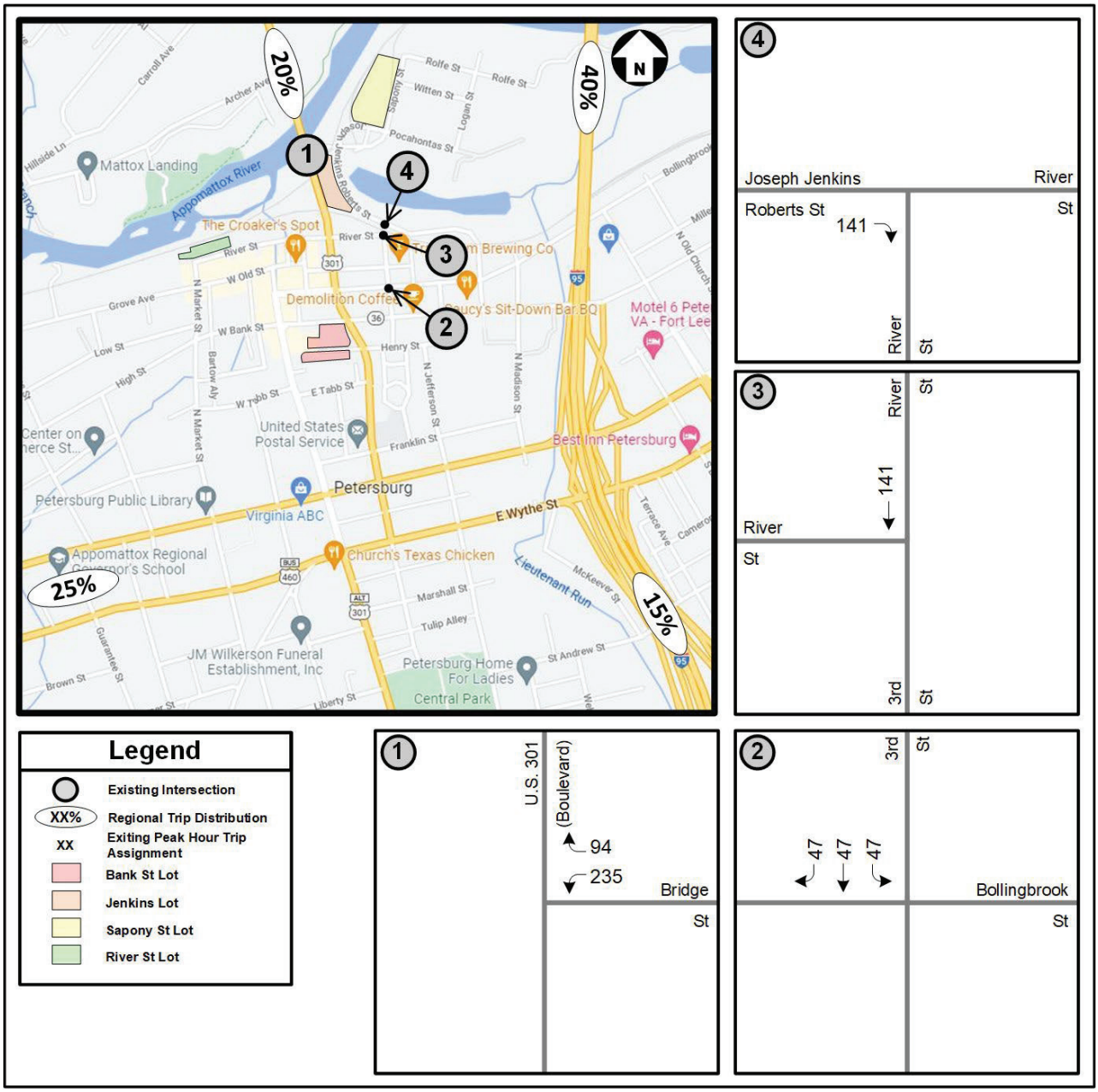



**Figure 11: Sapony Street Lot Vehicle Assignment**

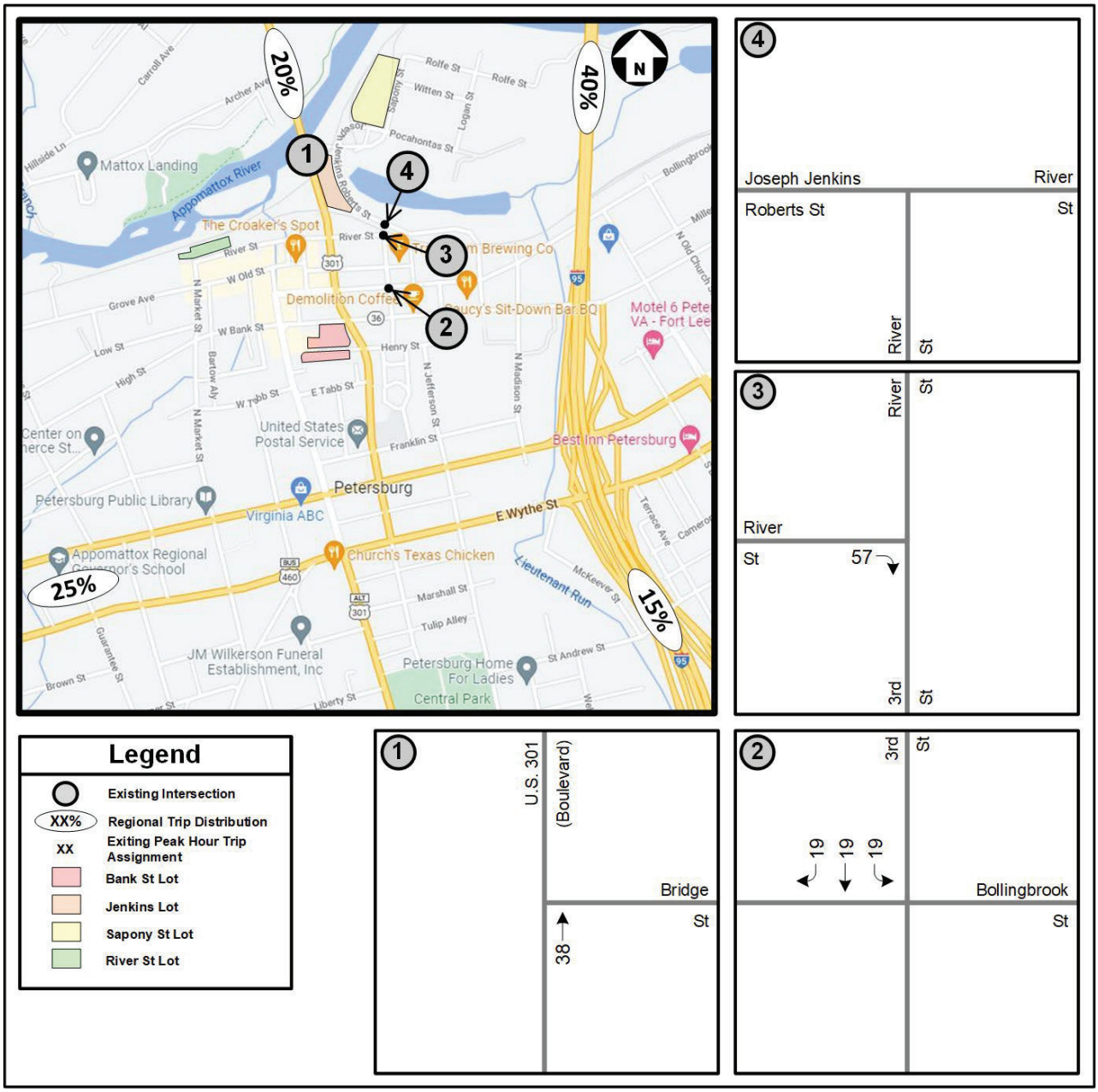



**Figure 12: River Street Lot Vehicle Assignment**

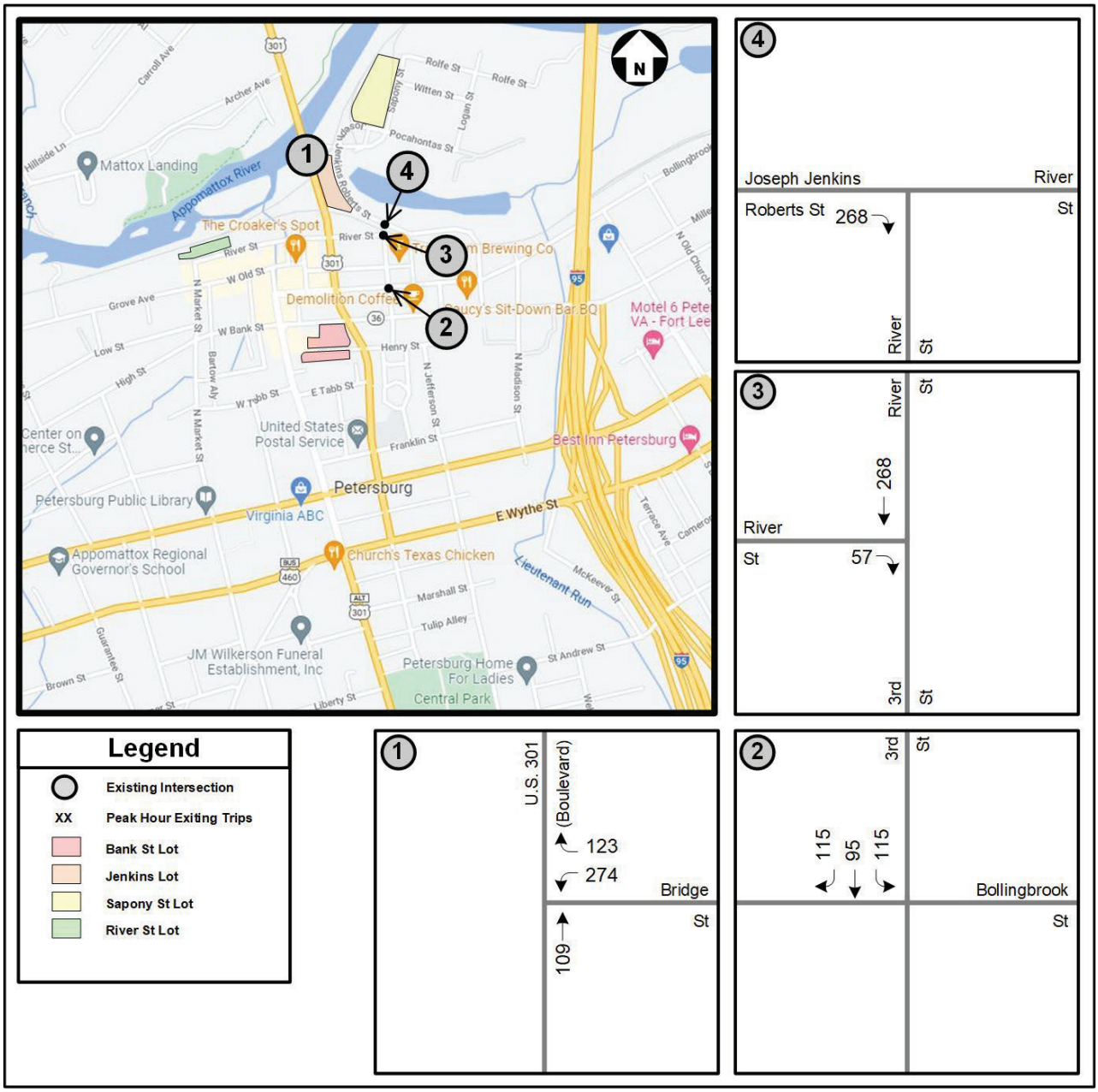



**Figure 13: Total Event Vehicle Trips**

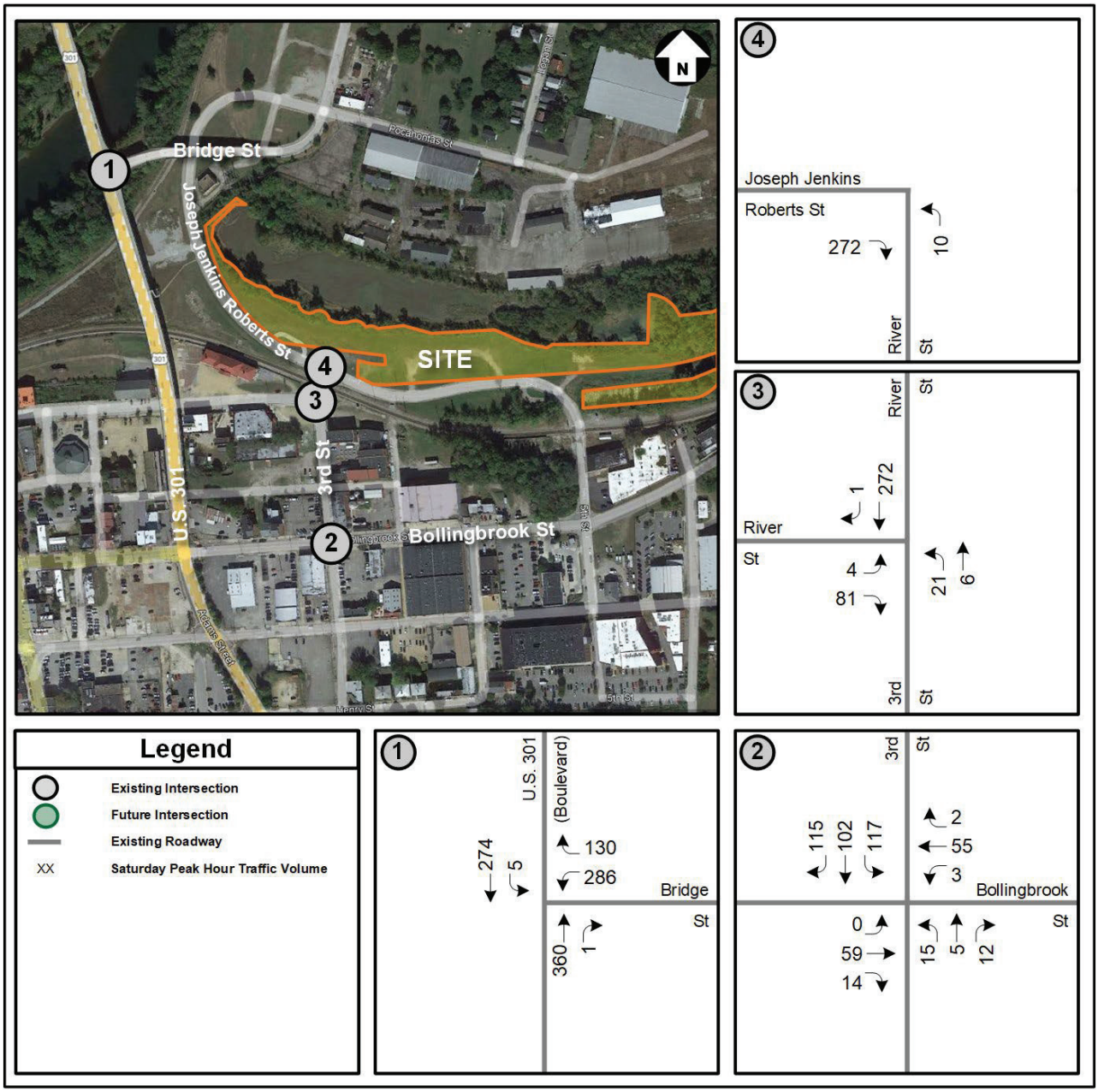



**Figure 14: Build (2025) Saturday Evening Peak Hour Traffic Volumes**

## Capacity Analysis

Capacity analysis was performed at the study intersections during the Saturday Evening Peak Hour. Synchro, Version 11 was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology and includes level of service (LOS), delay, and queue length comparisons for the turning movements analyzed. The capacity analysis results are summarized in the tables below and the Synchro output is included in the Appendix.

For unsignalized intersections, the average delays for the minor street turn movements are described as short delays (less than 25 seconds), moderate delays (between 25 and 50 seconds), and long delays (greater than 50 seconds). It is common for side street movements to experience long delays during the peak hours at intersections with major thoroughfares.

To be conservative, we assumed a peak hour factor (PHF) of 0.50, which is equivalent to all vehicles leaving the parking areas within a 30-minute period after a large event.

Table 1 shows the traffic capacity results for the intersection of U.S. 301 at Bridge Street for the existing and 2025 conditions.

**Table 1: Level-of-Service Summary for U.S. 301 at Bridge Street**

| Condition | Lane Group | Lane Storage (ft.) | Saturday Evening Peak Hour | | | |
|---|---|---|---|---|---|---|
| | | | LOS | Delay (sec) | Queue (ft.) | Overall LOS |
| Existing (2022) Traffic Conditions | WBL/R<br>NBT/R<br>SBL/T | -<br>-<br>- | B<br>-<br>A | 11.0<br>-<br>7.8 | 3<br>-<br>0 | N/A |
| Build (2025) Traffic Conditions | WBL/R<br>NBT/R<br>SBL/T | -<br>-<br>- | F<br>-<br>A | 890.8<br>-<br>9.2 | 1,810<br>-<br>0 | N/A |
| Build (2025) Traffic Conditions ***Officer Control*** | WBL/R<br>NBT/R<br>SBL/T | -<br>-<br>- | C<br>C<br>B | 29.5<br>21.1<br>18.8 | 136<br>84<br>66 | C<br>(23.8 sec) |

Based on the capacity analysis, the minor street left-turn movement currently operates with short delays during the Saturday Evening peak hour. Under build conditions, the minor street left-turn movement is expected to operate with long delays during the Saturday Evening peak hour with very long queues on Bridge Street. The intersection was modeled as a two-phase traffic signal in Synchro to simulate officer control. With officer control, the intersection is expected to operate at LOS C during the Saturday Evening peak hour with a queue of six vehicles on Bridge Street.

Table 2 shows the traffic capacity results for the intersection of Bollingbrook Street at 3rd Street for the existing and 2025 conditions.

**Table 2: Level-of-Service Summary for Bollingbrook Street at 3rd Street**

| Condition | Lane Group | Lane Storage (ft.) | Saturday Evening Peak Hour | | | |
|---|---|---|---|---|---|---|
| | | | LOS | Delay (sec) | Queue (ft.) | Overall LOS |
| Existing (2022) Traffic Conditions | EBL/T/R<br>WBL/T/R<br>NBL/T/R<br>SBL/T/R | -<br>-<br>-<br>- | A<br>A<br>A<br>B | 7.4<br>7.4<br>9.6<br>10.0 | 0<br>0<br>5<br>3 | N/A |
| Build (2025) Traffic Conditions | EBL/T/R<br>WBL/T/R<br>NBL/T/R<br>SBL/T/R | -<br>-<br>-<br>- | A<br>A<br>B<br>E | 7.4<br>7.5<br>14.8<br>42.8 | 0<br>0<br>13<br>325 | N/A |

Capacity analysis indicates that the minor street left-turn movement currently operates with short delays during the Saturday Evening peak hour. Under build conditions, the minor street left-turn movement is expected to operate with moderate delays

during the Saturday Evening peak hour. The queue length on southbound 3rd Street is projected to be approximately 13 vehicles, but it clears relatively quickly because there is light cross traffic on Bollingbrook Street.

Table 3 shows the traffic capacity results for the intersection of 3rd Street at River Street for the existing and 2025 conditions.

**Table 3: Level-of-Service Summary for 3rd Street at River Street**

| Condition | Lane Group | Lane Storage (ft.) | Saturday Evening Peak Hour | | | |
|---|---|---|---|---|---|---|
| | | | LOS | Delay (sec) | Queue (ft.) | Overall LOS |
| Existing (2022) Traffic Conditions | EBL/R<br>NBL/T<br>SBT/R | -<br>-<br>- | A<br>A<br>A | 6.8<br>7.4<br>7.0 | 5<br>5<br>0 | A<br>(7.1 sec) |
| Build (2025) Traffic Conditions | EBL/R<br>NBL/T<br>SBT/R | -<br>-<br>- | A<br>A<br>C | 8.6<br>9.2<br>15.9 | 5<br>23<br>130 | C<br>(24.2 sec) |

Capacity analysis indicates that this intersection currently operates at LOS A during the Saturday Evening peak hour with queue lengths of one vehicle or less. Under build conditions, the intersection is expected to operate at LOS C with queue lengths of six vehicles or less. This intersection has Stop signs on the northbound 3rd Street and eastbound River Street approaches, but was modeled as a three-way Stop intersection in Synchro to be conservative.

Table 4 shows the traffic capacity results for the intersection of Joseph Jenkins Roberts Street at River Street for the existing and 2025 conditions.

**Table 4: Level-of-Service Summary for Joseph Jenkins Roberts Street at River Street**

| Condition | Lane Group | Lane Storage (ft.) | Saturday Evening Peak Hour | | | |
|---|---|---|---|---|---|---|
| | | | LOS | Delay (sec) | Queue (ft.) | Overall LOS |
| Existing (2022) Traffic Conditions | EBT/R<br>WBL/T<br>NBL/R | -<br>-<br>- | -<br>A<br>A | -<br>1.8<br>8.7 | -<br>0<br>2 | N/A |
| Build (2025) Traffic Conditions | EBT/R<br>WBL/T<br>NBL/R | -<br>-<br>- | -<br>A<br>B | -<br>2.1<br>10.2 | -<br>0<br>2 | N/A |

Capacity analysis indicates that the minor street left-turn movement currently operates with short delays during the Saturday Evening peak hour. Under build conditions, the minor street left-turn movement is expected to continue to operate with short delays during the Saturday Evening peak hour with queue lengths of one vehicle or less.

Table 5 shows the average daily traffic (ADT) volumes we counted on Bollingbrook Street and River Street from September 1 through September 4. The tube count data are enclosed for reference.

**Table 5: Average Daily Traffic (ADT) Volumes**

| Street Segment | Thursday Sept 1 | Friday Sept 2 | Saturday Sept 3 | Sunday Sept 4 |
|---|---|---|---|---|
| Bollingbrook Street between 3rd Street and 5th Street | 4,148 vpd | 4,115 vpd | 3,286 vpd | 2,538 vpd |
| River Street between 3rd Street and 5th Street | 204 vpd | 227 vpd | 157 vpd | 132 vpd |

## Summary and Recommendations

Based on the results of the capacity analysis, all four study intersections will operate acceptably after a large event with the following recommendations:

U.S. 301 at Bridge Street

- Utilize officer control to help drivers exit from Bridge Street onto U.S. 301

The segment of River Street between 3rd Street and 5th Street carries just 200 vpd, and just 5 vehicles during the Saturday Evening peak hour. Bollingbrook Street has a capacity of approximately 10,000 vpd, and is only carrying 4,100 vpd, so Bollingbrook Street can easily handle 200 additional vpd if River Street is removed.

Figure 15 shows the existing lane configuration and recommended traffic control measures.

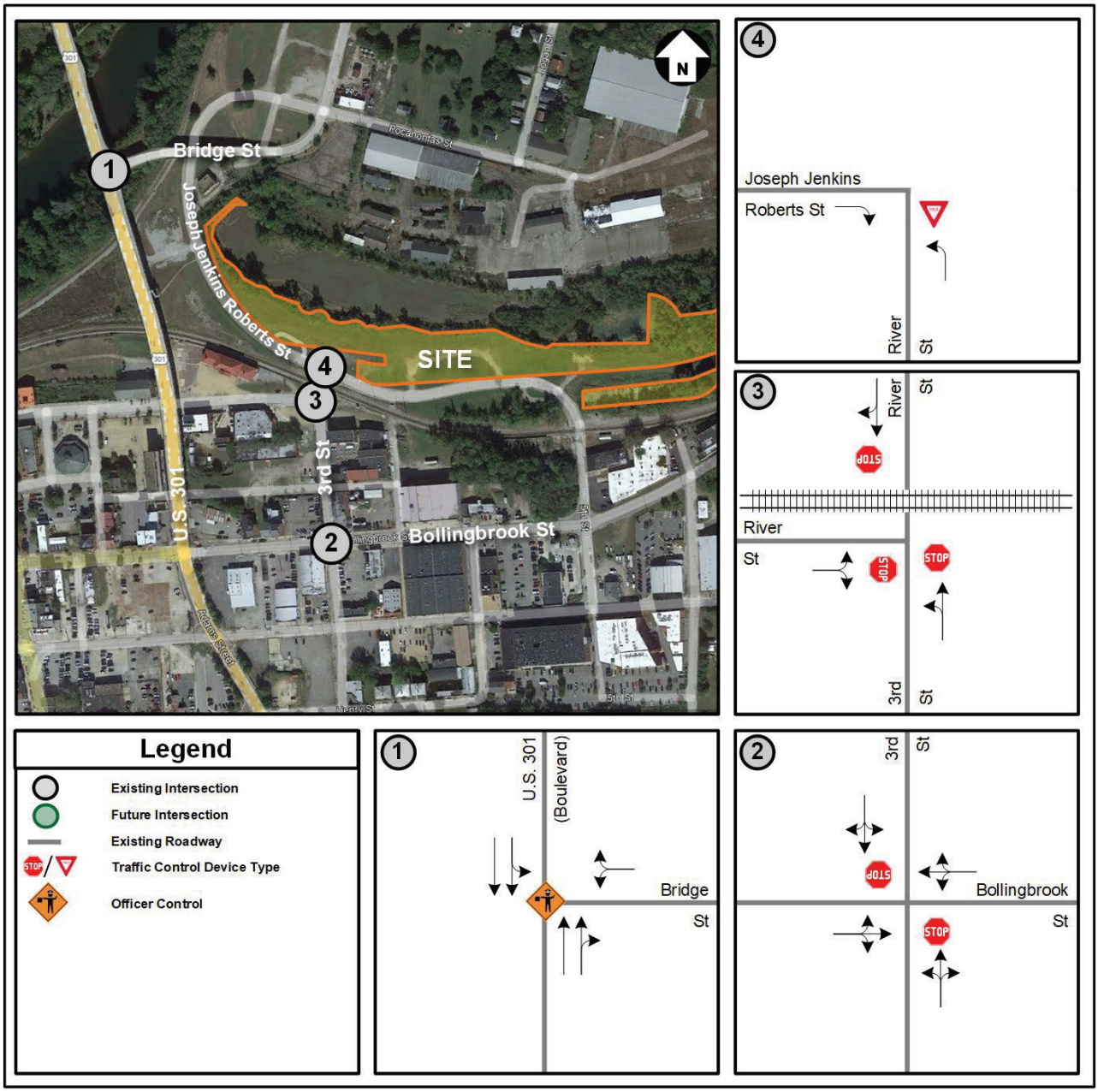



**Figure 15: Recommended Lane Configuration and Traffic Control**

BSI
TRAFFIC DATA COLLECTION

File Name : Petersburg(Bridge St and Dr Martin Luther King Jr Memorial Bric
Site Code :
Start Date : 1/27/2022
Page No : 1

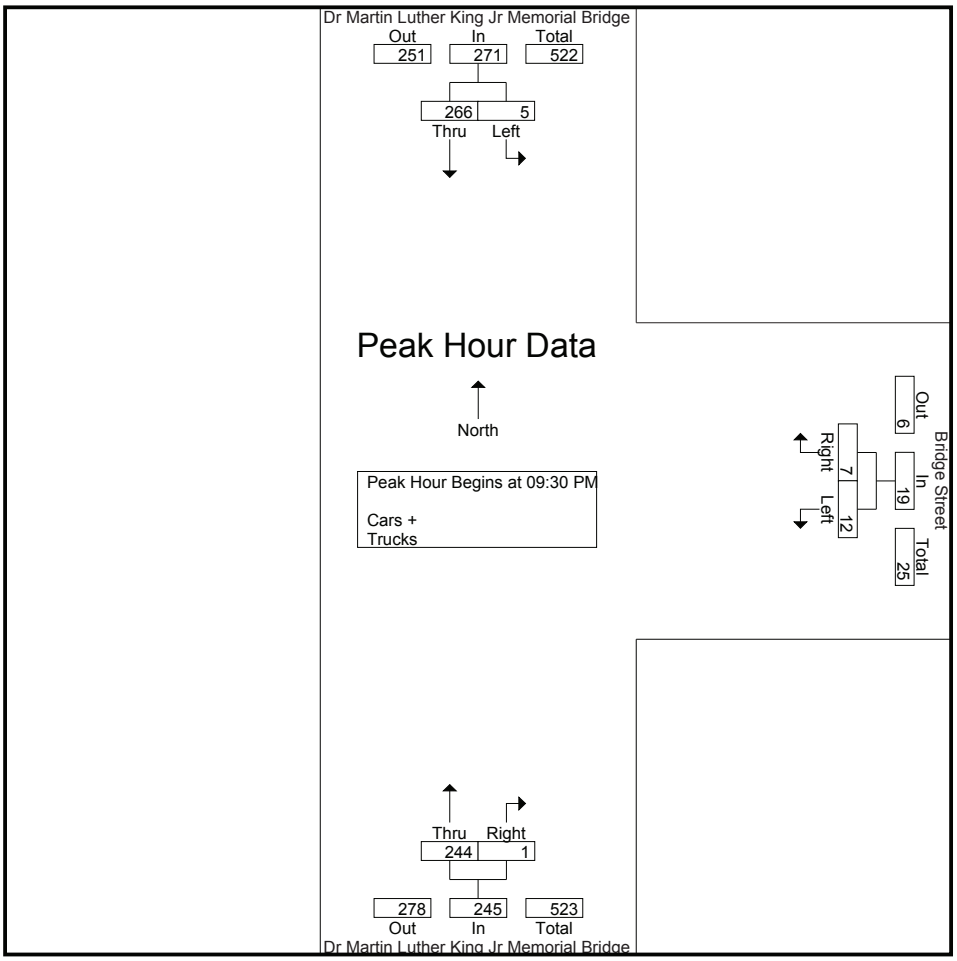
Groups Printed- Cars + - Trucks

| | Dr Martin Luther King Jr Memorial Bridge Southbound | | | Bridge Street Westbound | | | Dr Martin Luther King Jr Memorial Bridge Northbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Left | App. Total | Right | Left | App. Total | Right | Thru | App. Total | Int. To |
| 09:30 PM | 72 | 0 | 72 | 3 | 3 | 6 | 1 | 76 | 77 | 1 |
| 09:45 PM | 59 | 2 | 61 | 2 | 3 | 5 | 0 | 59 | 59 | 1 |
| Total | 131 | 2 | 133 | 5 | 6 | 11 | 1 | 135 | 136 | 2 |
| | | | | | | | | | | |
| 10:00 PM | 75 | 1 | 76 | 2 | 3 | 5 | 0 | 50 | 50 | 1 |
| 10:15 PM | 60 | 2 | 62 | 0 | 3 | 3 | 0 | 59 | 59 | 1 |
| 10:30 PM | 79 | 0 | 79 | 0 | 3 | 3 | 0 | 56 | 56 | 1 |
| 10:45 PM | 83 | 1 | 84 | 2 | 1 | 3 | 0 | 45 | 45 | 1 |
| Total | 297 | 4 | 301 | 4 | 10 | 14 | 0 | 210 | 210 | 5 |
| | | | | | | | | | | |
| 11:00 PM | 72 | 1 | 73 | 0 | 1 | 1 | 0 | 58 | 58 | 1 |
| 11:15 PM | 57 | 2 | 59 | 0 | 0 | 0 | 0 | 49 | 49 | 1 |
| Grand Total | 557 | 9 | 566 | 9 | 17 | 26 | 1 | 452 | 453 | 10 |
| Apprch % | 98.4 | 1.6 | | 34.6 | 65.4 | | 0.2 | 99.8 | | |
| Total % | 53.3 | 0.9 | 54.2 | 0.9 | 1.6 | 2.5 | 0.1 | 43.3 | 43.3 | |
| Cars + | 557 | 9 | 566 | 9 | 17 | 26 | 1 | 452 | 453 | 10 |
| % Cars + | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 1 |
| Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| % Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

TRAFFIC DATA COLLECTION

File Name : Petersburg(Bridge St and Dr Martin Luther King Jr Memorial Bric
Site Code :
Start Date : 1/27/2022
Page No : 2

| | Dr Martin Luther King Jr Memorial Bridge Southbound | | | Bridge Street Westbound | | | Dr Martin Luther King Jr Memorial Bridge Northbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Left | App. Total | Right | Left | App. Total | Right | Thru | App. Total | Int. To |
| Peak Hour Analysis From 09:30 PM to 11:15 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 09:30 PM | | | | | | | | | | |
| 09:30 PM | 72 | 0 | 72 | **3** | **3** | **6** | **1** | **76** | **77** | |
| 09:45 PM | 59 | **2** | 61 | 2 | 3 | 5 | 0 | 59 | 59 | 1 |
| 10:00 PM | **75** | 1 | **76** | 2 | 3 | 5 | 0 | 50 | 50 | 1 |
| 10:15 PM | 60 | 2 | 62 | 0 | 3 | 3 | 0 | 59 | 59 | 1 |
| Total Volume | 266 | 5 | 271 | 7 | 12 | 19 | 1 | 244 | 245 | 5 |
| % App. Total | 98.2 | 1.8 | | 36.8 | 63.2 | | 0.4 | 99.6 | | |
| PHF | .887 | .625 | .891 | .583 | 1.00 | .792 | .250 | .803 | .795 | .8 |




File Name : Petersburg-Petersburg(Third St and Bollingbrook
Site Code :
Start Date : 7/30/2022
Page No : 1

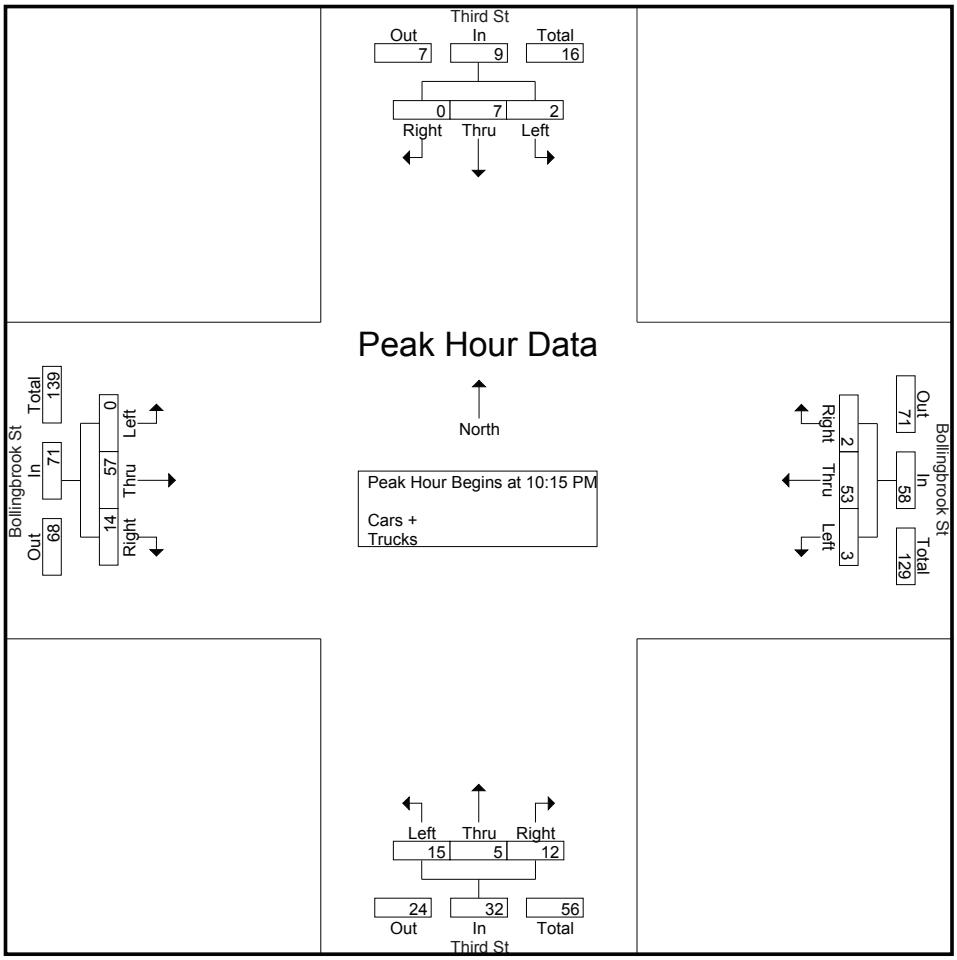
Groups Printed- Cars + - Trucks

| | Third St Southbound | | | | Bollingbrook St Westbound | | | | Third St Northbound | | | | Bollingbrook St Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Int. T |
| 09:30 PM | 1 | 1 | 0 | 2 | 1 | 17 | 1 | 19 | 7 | 2 | 3 | 12 | 0 | 17 | 0 | 17 | |
| 09:45 PM | 0 | 2 | 1 | 3 | 0 | 17 | 0 | 17 | 1 | 2 | 5 | 8 | 0 | 7 | 0 | 7 | |
| Total | 1 | 3 | 1 | 5 | 1 | 34 | 1 | 36 | 8 | 4 | 8 | 20 | 0 | 24 | 0 | 24 | |
| 10:00 PM | 0 | 1 | 1 | 2 | 2 | 7 | 3 | 12 | 3 | 0 | 3 | 6 | 3 | 14 | 0 | 17 | |
| 10:15 PM | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 13 | 3 | 1 | 6 | 10 | 3 | 12 | 0 | 15 | |
| 10:30 PM | 0 | 6 | 0 | 6 | 0 | 15 | 1 | 16 | 8 | 2 | 4 | 14 | 7 | 15 | 0 | 22 | |
| 10:45 PM | 0 | 0 | 2 | 2 | 1 | 12 | 0 | 13 | 1 | 0 | 4 | 5 | 3 | 13 | 0 | 16 | |
| Total | 0 | 7 | 3 | 10 | 3 | 47 | 4 | 54 | 15 | 3 | 17 | 35 | 16 | 54 | 0 | 70 | 1 |
| 11:00 PM | 0 | 1 | 0 | 1 | 1 | 13 | 2 | 16 | 0 | 2 | 1 | 3 | 1 | 17 | 0 | 18 | |
| 11:15 PM | 0 | 1 | 4 | 5 | 0 | 12 | 1 | 13 | 1 | 2 | 0 | 3 | 5 | 12 | 0 | 17 | |
| 11:30 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | |
| Grand Total | 1 | 12 | 8 | 21 | 5 | 107 | 8 | 120 | 24 | 11 | 27 | 62 | 22 | 107 | 0 | 129 | 3 |
| Apprch % | 4.8 | 57.1 | 38.1 | | 4.2 | 89.2 | 6.7 | | 38.7 | 17.7 | 43.5 | | 17.1 | 82.9 | 0 | | |
| Total % | 0.3 | 3.6 | 2.4 | 6.3 | 1.5 | 32.2 | 2.4 | 36.1 | 7.2 | 3.3 | 8.1 | 18.7 | 6.6 | 32.2 | 0 | 38.9 | |
| Cars + | 1 | 12 | 8 | 21 | 5 | 107 | 8 | 120 | 24 | 11 | 27 | 62 | 22 | 107 | 0 | 129 | 3 |
| % Cars + | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 0 | 100 | 1 |
| Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| % Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

TRAFFIC DATA COLLECTION

File Name : Petersburg-Petersburg(Third St and Bollingbrook
Site Code :
Start Date : 7/30/2022
Page No : 2

| | Third St Southbound | | | | Bollingbrook St Westbound | | | | Third St Northbound | | | | Bollingbrook St Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Int. T |
| Peak Hour Analysis From 09:30 PM to 11:30 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 10:15 PM | | | | | | | | | | | | | | | | | |
| 10:15 PM | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 13 | 3 | 1 | **6** | 10 | 3 | 12 | 0 | 15 | |
| 10:30 PM | 0 | **6** | 0 | **6** | 0 | **15** | 1 | **16** | **8** | **2** | 4 | **14** | **7** | 15 | 0 | **22** | |
| 10:45 PM | 0 | 0 | **2** | 2 | **1** | 12 | 0 | 13 | 1 | 0 | 4 | 5 | 3 | 13 | 0 | 16 | |
| 11:00 PM | 0 | 1 | 0 | 1 | 1 | 13 | **2** | 16 | 0 | 2 | 1 | 3 | 1 | **17** | 0 | 18 | |
| Total Volume | 0 | 7 | 2 | 9 | 2 | 53 | 3 | 58 | 12 | 5 | 15 | 32 | 14 | 57 | 0 | 71 | 1 |
| % App. Total | 0 | 77.8 | 22.2 | | 3.4 | 91.4 | 5.2 | | 37.5 | 15.6 | 46.9 | | 19.7 | 80.3 | 0 | | |
| PHF | .000 | .292 | .250 | .375 | .500 | .883 | .375 | .906 | .375 | .625 | .625 | .571 | .500 | .838 | .000 | .807 | .7 |



BSI
TRAFFIC DATA COLLECTION

File Name : Petersburg-Petersburg(3rd Street and River Str
Site Code :
Start Date : 7/30/2022
Page No : 1

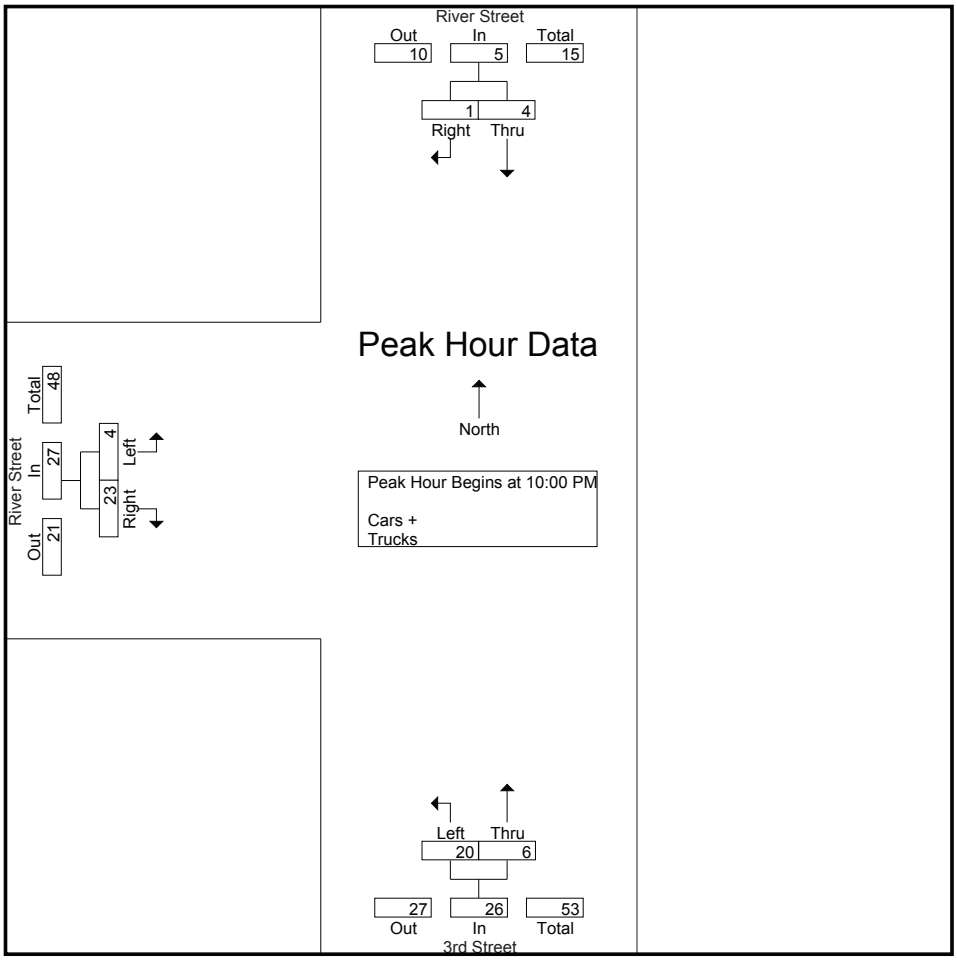
Groups Printed- Cars + - Trucks

| | River Street Southbound | | | 3rd Street Northbound | | | River Street Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | App. Total | Thru | Left | App. Total | Right | Left | App. Total | Int. T |
| 09:30 PM | 0 | 2 | 2 | 2 | 3 | 5 | 8 | 2 | 10 | |
| 09:45 PM | 0 | 1 | 1 | 1 | 2 | 3 | 4 | 0 | 4 | |
| Total | 0 | 3 | 3 | 3 | 5 | 8 | 12 | 2 | 14 | |
| 10:00 PM | 0 | 0 | 0 | 1 | 7 | 8 | 2 | 1 | 3 | |
| 10:15 PM | 0 | 0 | 0 | 0 | 2 | 2 | 7 | 1 | 8 | |
| 10:30 PM | 0 | 0 | 0 | 4 | 9 | 13 | 12 | 1 | 13 | |
| 10:45 PM | 1 | 4 | 5 | 1 | 2 | 3 | 2 | 1 | 3 | |
| Total | 1 | 4 | 5 | 6 | 20 | 26 | 23 | 4 | 27 | |
| 11:00 PM | 0 | 0 | 0 | 0 | 3 | 3 | 2 | 0 | 2 | |
| 11:15 PM | 1 | 0 | 1 | 0 | 2 | 2 | 1 | 0 | 1 | |
| 11:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | |
| Grand Total | 2 | 7 | 9 | 9 | 30 | 39 | 39 | 6 | 45 | |
| Apprch % | 22.2 | 77.8 | | 23.1 | 76.9 | | 86.7 | 13.3 | | |
| Total % | 2.2 | 7.5 | 9.7 | 9.7 | 32.3 | 41.9 | 41.9 | 6.5 | 48.4 | |
| Cars + | 2 | 7 | 9 | 9 | 30 | 39 | 39 | 6 | 45 | |
| % Cars + | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| % Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

TRAFFIC DATA COLLECTION

File Name : Petersburg-Petersburg(3rd Street and River Str
Site Code :
Start Date : 7/30/2022
Page No : 2

| | River Street Southbound | | | 3rd Street Northbound | | | River Street Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | App. Total | Thru | Left | App. Total | Right | Left | App. Total | Int. T |
| Peak Hour Analysis From 09:30 PM to 11:30 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 10:00 PM | | | | | | | | | | |
| 10:00 PM | 0 | 0 | 0 | 1 | 7 | 8 | 2 | **1** | 3 | |
| 10:15 PM | 0 | 0 | 0 | 0 | 2 | 2 | 7 | 1 | 8 | |
| 10:30 PM | 0 | 0 | 0 | **4** | **9** | **13** | **12** | 1 | **13** | |
| 10:45 PM | **1** | **4** | **5** | 1 | 2 | 3 | 2 | 1 | 3 | |
| Total Volume | 1 | 4 | 5 | 6 | 20 | 26 | 23 | 4 | 27 | |
| % App. Total | 20 | 80 | | 23.1 | 76.9 | | 85.2 | 14.8 | | |
| PHF | .250 | .250 | .250 | .375 | .556 | .500 | .479 | 1.00 | .519 | |



BSI
TRAFFIC DATA COLLECTION

File Name : Petersburg-Petersburg(River Street and Joseph Jenkins Roberts
Site Code :
Start Date : 7/30/2022
Page No : 1

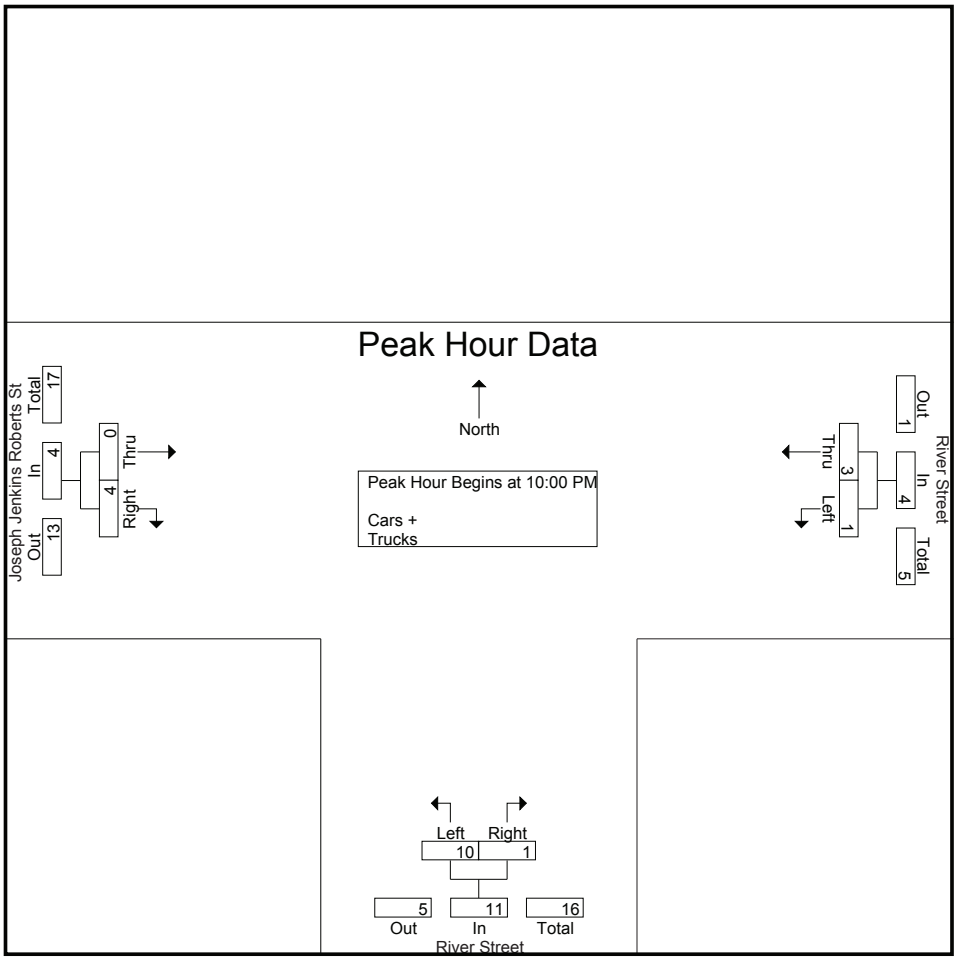
Groups Printed- Cars + - Trucks

| | River Street Westbound | | | River Street Northbound | | | Joseph Jenkins Roberts St Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Left | App. Total | Right | Left | App. Total | Right | Thru | App. Total | Int. T |
| 09:30 PM | 0 | 0 | 0 | 0 | 4 | 4 | 2 | 0 | 2 | |
| 09:45 PM | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | |
| Total | 0 | 0 | 0 | 0 | 5 | 5 | 3 | 0 | 3 | |
| 10:00 PM | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | |
| 10:15 PM | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | |
| 10:30 PM | 1 | 0 | 1 | 1 | 4 | 5 | 0 | 0 | 0 | |
| 10:45 PM | 2 | 1 | 3 | 0 | 3 | 3 | 4 | 0 | 4 | |
| Total | 3 | 1 | 4 | 1 | 10 | 11 | 4 | 0 | 4 | |
| 11:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | |
| 11:15 PM | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Grand Total | 3 | 2 | 5 | 1 | 15 | 16 | 7 | 1 | 8 | |
| Apprch % | 60 | 40 | | 6.2 | 93.8 | | 87.5 | 12.5 | | |
| Total % | 10.3 | 6.9 | 17.2 | 3.4 | 51.7 | 55.2 | 24.1 | 3.4 | 27.6 | |
| Cars + | 3 | 2 | 5 | 1 | 15 | 16 | 7 | 1 | 8 | |
| % Cars + | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| % Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

TRAFFIC DATA COLLECTION

File Name : Petersburg-Petersburg(River Street and Joseph Jenkins Roberts
Site Code :
Start Date : 7/30/2022
Page No : 2

| | River Street Westbound | | | River Street Northbound | | | Joseph Jenkins Roberts St Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Left | App. Total | Right | Left | App. Total | Right | Thru | App. Total | Int. T |
| Peak Hour Analysis From 09:30 PM to 11:15 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 10:00 PM | | | | | | | | | | |
| 10:00 PM | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | |
| 10:15 PM | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | |
| 10:30 PM | 1 | 0 | 1 | **1** | **4** | **5** | 0 | 0 | 0 | |
| 10:45 PM | **2** | **1** | **3** | 0 | 3 | 3 | **4** | 0 | **4** | |
| Total Volume | 3 | 1 | 4 | 1 | 10 | 11 | 4 | 0 | 4 | |
| % App. Total | 75 | 25 | | 9.1 | 90.9 | | 100 | 0 | | |
| PHF | .375 | .250 | .333 | .250 | .625 | .550 | .250 | .000 | .250 | |



:Viewer Pro v1.6.4.124

# Daily Vehicle Volume Report

Study Date: Thursday, 09/01/2022
Unit ID: Joseph Jenkins Roberts St
Location: Joseph Jenkins Roberts Street

| | Westbound Volume | Eastbound Volume | Total Volume |
|---|---|---|---|
| 00 - 00:59 | 0 | 0 | **0** |
| 00 - 01:59 | 0 | 0 | **0** |
| 00 - 02:59 | 0 | 0 | **0** |
| 00 - 03:59 | 0 | 0 | **0** |
| 00 - 04:59 | 3 | 1 | **4** |
| 00 - 05:59 | 0 | 0 | **0** |
| 00 - 06:59 | 7 | 2 | **9** |
| 00 - 07:59 | 5 | 7 | **12** |
| 00 - 08:59 | 6 | 5 | **11** |
| 00 - 09:59 | 7 | 6 | **13** |
| 00 - 10:59 | 3 | 7 | **10** |
| 00 - 11:59 | 12 | 6 | **18** |
| 00 - 12:59 | 6 | 9 | **15** |
| 00 - 13:59 | 8 | 1 | **9** |
| 00 - 14:59 | 8 | 6 | **14** |
| 00 - 15:59 | 6 | 16 | **22** |
| 00 - 16:59 | 7 | 6 | **13** |
| 00 - 17:59 | 6 | 6 | **12** |
| 00 - 18:59 | 4 | 6 | **10** |
| 00 - 19:59 | 9 | 0 | **9** |
| 00 - 20:59 | 6 | 4 | **10** |
| 00 - 21:59 | 3 | 6 | **9** |
| 00 - 22:59 | 1 | 0 | **1** |
| 00 - 23:59 | 0 | 3 | **3** |
| **Totals** | **107** | **97** | **204** |
| **Peak Time** | **10:44 - 11:43** | **07:23 - 08:22** | **10:52 - 11:51** |
| **eak Volume** | **13** | **10** | **18** |
| **Peak Time** | **19:15 - 20:14** | **14:58 - 15:57** | **14:36 - 15:35** |
| **eak Volume** | **12** | **17** | **26** |

# Daily Vehicle Volume Report

Study Date: Friday, 09/02/2022
Unit ID: Joseph Jenkins Roberts St
Location: Joseph Jenkins Roberts Street

| | Westbound Volume | Eastbound Volume | Total Volume |
|---|---|---|---|
| **00 - 00:59** | 1 | 1 | **2** |
| **00 - 01:59** | 1 | 0 | **1** |
| **00 - 02:59** | 1 | 3 | **4** |
| **00 - 03:59** | 0 | 0 | **0** |
| **00 - 04:59** | 0 | 1 | **1** |
| **00 - 05:59** | 2 | 0 | **2** |
| **00 - 06:59** | 6 | 2 | **8** |
| **00 - 07:59** | 3 | 5 | **8** |
| **00 - 08:59** | 6 | 6 | **12** |
| **00 - 09:59** | 8 | 6 | **14** |
| **00 - 10:59** | 6 | 6 | **12** |
| **00 - 11:59** | 6 | 7 | **13** |
| **00 - 12:59** | 9 | 9 | **18** |
| **00 - 13:59** | 8 | 10 | **18** |
| **00 - 14:59** | 9 | 6 | **15** |
| **00 - 15:59** | 8 | 12 | **20** |
| **00 - 16:59** | 6 | 6 | **12** |
| **00 - 17:59** | 8 | 6 | **14** |
| **00 - 18:59** | 4 | 9 | **13** |
| **00 - 19:59** | 5 | 6 | **11** |
| **00 - 20:59** | 6 | 5 | **11** |
| **00 - 21:59** | 2 | 0 | **2** |
| **00 - 22:59** | 3 | 6 | **9** |
| **00 - 23:59** | 5 | 2 | **7** |
| **Totals** | **113** | **114** | **227** |
| **Peak Time** | **09:05 - 10:04** | **07:36 - 08:35** | **07:36 - 08:35** |
| **eak Volume** | **9** | **9** | **16** |
| **Peak Time** | **14:32 - 15:31** | **13:09 - 14:08** | **14:33 - 15:32** |
| **eak Volume** | **13** | **12** | **25** |

:Viewer Pro v1.6.4.124

# Daily Vehicle Volume Report

Study Date: Saturday, 09/03/2022
Unit ID: Joseph Jenkins Roberts St
Location: Joseph Jenkins Roberts Street

| | Westbound Volume | Eastbound Volume | Total Volume |
|---|---|---|---|
| 00 - 00:59 | 2 | 1 | **3** |
| 00 - 01:59 | 1 | 3 | **4** |
| 00 - 02:59 | 2 | 0 | **2** |
| 00 - 03:59 | 0 | 0 | **0** |
| 00 - 04:59 | 0 | 1 | **1** |
| 00 - 05:59 | 2 | 0 | **2** |
| 00 - 06:59 | 2 | 2 | **4** |
| 00 - 07:59 | 5 | 2 | **7** |
| 00 - 08:59 | 2 | 1 | **3** |
| 00 - 09:59 | 4 | 4 | **8** |
| 00 - 10:59 | 4 | 2 | **6** |
| 00 - 11:59 | 8 | 1 | **9** |
| 00 - 12:59 | 4 | 7 | **11** |
| 00 - 13:59 | 5 | 4 | **9** |
| 00 - 14:59 | 1 | 8 | **9** |
| 00 - 15:59 | 3 | 6 | **9** |
| 00 - 16:59 | 2 | 4 | **6** |
| 00 - 17:59 | 6 | 5 | **11** |
| 00 - 18:59 | 10 | 7 | **17** |
| 00 - 19:59 | 6 | 5 | **11** |
| 00 - 20:59 | 1 | 3 | **4** |
| 00 - 21:59 | 3 | 3 | **6** |
| 00 - 22:59 | 3 | 6 | **9** |
| 00 - 23:59 | 5 | 1 | **6** |
| **Totals** | **81** | **76** | **157** |
| **Peak Time** | **10:49 - 11:48** | **09:08 - 10:07** | **09:08 - 10:07** |
| **eak Volume** | **8** | **6** | **11** |
| **Peak Time** | **18:04 - 19:03** | **14:20 - 15:19** | **17:25 - 18:24** |
| **eak Volume** | **11** | **9** | **18** |

# Daily Vehicle Volume Report

Study Date: Sunday, 09/04/2022
Unit ID: Joseph Jenkins Roberts St
Location: Joseph Jenkins Roberts Street

| | Westbound Volume | Eastbound Volume | Total Volume |
|---|---|---|---|
| **00 - 00:59** | 4 | 5 | **9** |
| **00 - 01:59** | 0 | 1 | **1** |
| **00 - 02:59** | 0 | 0 | **0** |
| **00 - 03:59** | 0 | 0 | **0** |
| **00 - 04:59** | 0 | 0 | **0** |
| **00 - 05:59** | 3 | 2 | **5** |
| **00 - 06:59** | 0 | 1 | **1** |
| **00 - 07:59** | 1 | 1 | **2** |
| **00 - 08:59** | 3 | 1 | **4** |
| **00 - 09:59** | 3 | 4 | **7** |
| **00 - 10:59** | 3 | 0 | **3** |
| **00 - 11:59** | 3 | 5 | **8** |
| **00 - 12:59** | 5 | 6 | **11** |
| **00 - 13:59** | 5 | 3 | **8** |
| **00 - 14:59** | 2 | 6 | **8** |
| **00 - 15:59** | 5 | 7 | **12** |
| **00 - 16:59** | 9 | 2 | **11** |
| **00 - 17:59** | 5 | 5 | **10** |
| **00 - 18:59** | 5 | 11 | **16** |
| **00 - 19:59** | 2 | 4 | **6** |
| **00 - 20:59** | 3 | 2 | **5** |
| **00 - 21:59** | 1 | 1 | **2** |
| **00 - 22:59** | 0 | 0 | **0** |
| **00 - 23:59** | 3 | 0 | **3** |
| **Totals** | **65** | **67** | **132** |
| **Peak Time** | **09:47 - 10:46** | **00:09 - 01:08** | **00:00 - 00:59** |
| **eak Volume** | **5** | **6** | **9** |
| **Peak Time** | **15:27 - 16:26** | **18:00 - 18:59** | **15:20 - 16:19** |
| **eak Volume** | **11** | **11** | **18** |

Harbor Redevelopment
1: 2nd St & Bridge St

Existing (2022) Conditions
Timing Plan: Sat Peak Hour

| Intersection | | | | | | |
|---|---|---|---|---|---|---|
| Int Delay, s/veh | 0.4 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 12 | 7 | 244 | 1 | 5 | 266 |
| Future Vol, veh/h | 12 | 7 | 244 | 1 | 5 | 266 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 14 | 8 | 284 | 1 | 6 | 309 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 452 | 143 | 0 | 0 | 285 | 0 |
| Stage 1 | 285 | - | - | - | - | - |
| Stage 2 | 167 | - | - | - | - | - |
| Critical Hdwy | 6.84 | 6.94 | - | - | 4.14 | - |
| Critical Hdwy Stg 1 | 5.84 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.84 | - | - | - | - | - |
| Follow-up Hdwy | 3.52 | 3.32 | - | - | 2.22 | - |
| Pot Cap-1 Maneuver | 536 | 879 | - | - | 1274 | - |
| Stage 1 | 738 | - | - | - | - | - |
| Stage 2 | 845 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 533 | 879 | - | - | 1274 | - |
| Mov Cap-2 Maneuver | 533 | - | - | - | - | - |
| Stage 1 | 738 | - | - | - | - | - |
| Stage 2 | 840 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 11 | 0 | 0.1 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 623 | 1274 | - |
| HCM Lane V/C Ratio | - | - | 0.035 | 0.005 | - |
| HCM Control Delay (s) | - | - | 11 | 7.8 | 0 |
| HCM Lane LOS | - | - | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.1 | 0 | - |

| Intersection | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Int Delay, s/veh | 2.5 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 1 | 57 | 14 | 3 | 53 | 2 | 15 | 5 | 12 | 2 | 7 | 1 |
| Future Vol, veh/h | 1 | 57 | 14 | 3 | 53 | 2 | 15 | 5 | 12 | 2 | 7 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 1 | 78 | 19 | 4 | 73 | 3 | 21 | 7 | 16 | 3 | 10 | 1 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 76 | 0 | 0 | 97 | 0 | 0 | 178 | 174 | 88 | 184 | 182 | 75 |
| Stage 1 | - | - | - | - | - | - | 90 | 90 | - | 83 | 83 | - |
| Stage 2 | - | - | - | - | - | - | 88 | 84 | - | 101 | 99 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1523 | - | - | 1496 | - | - | 784 | 719 | 970 | 777 | 712 | 986 |
| Stage 1 | - | - | - | - | - | - | 917 | 820 | - | 925 | 826 | - |
| Stage 2 | - | - | - | - | - | - | 920 | 825 | - | 905 | 813 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1523 | - | - | 1496 | - | - | 772 | 716 | 970 | 756 | 709 | 986 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 772 | 716 | - | 756 | 709 | - |
| Stage 1 | - | - | - | - | - | - | 916 | 819 | - | 924 | 824 | - |
| Stage 2 | - | - | - | - | - | - | 905 | 823 | - | 881 | 812 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.1 | 0.4 | 9.6 | 10 |
| HCM LOS | | | A | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 825 | 1523 | - | - | 1496 | - | - | 739 |
| HCM Lane V/C Ratio | 0.053 | 0.001 | - | - | 0.003 | - | - | 0.019 |
| HCM Control Delay (s) | 9.6 | 7.4 | 0 | - | 7.4 | 0 | - | 10 |
| HCM Lane LOS | A | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0.2 | 0 | - | - | 0 | - | - | 0.1 |

Harbor Redevelopment
3: 3rd St & River St

Existing (2022) Conditions
Timing Plan: Sat Peak Hour

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.1 |
| Intersection LOS | A |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 4 | 23 | 20 | 6 | 4 | 1 |
| Future Vol, veh/h | 4 | 23 | 20 | 6 | 4 | 1 |
| Peak Hour Factor | 0.56 | 0.56 | 0.56 | 0.56 | 0.56 | 0.56 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 7 | 41 | 36 | 11 | 7 | 2 |
| Number of Lanes | 1 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 1 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 6.8 | 7.4 | 7 |
| HCM LOS | A | A | A |

| Lane | NBLn1 | EBLn1 | SBLn1 |
|---|---|---|---|
| Vol Left, % | 77% | 15% | 0% |
| Vol Thru, % | 23% | 0% | 80% |
| Vol Right, % | 0% | 85% | 20% |
| Sign Control | Stop | Stop | Stop |
| Traffic Vol by Lane | 26 | 27 | 5 |
| LT Vol | 20 | 4 | 0 |
| Through Vol | 6 | 0 | 4 |
| RT Vol | 0 | 23 | 1 |
| Lane Flow Rate | 46 | 48 | 9 |
| Geometry Grp | 1 | 1 | 1 |
| Degree of Util (X) | 0.054 | 0.048 | 0.01 |
| Departure Headway (Hd) | 4.18 | 3.548 | 3.934 |
| Convergence, Y/N | Yes | Yes | Yes |
| Cap | 860 | 1007 | 910 |
| Service Time | 2.191 | 1.577 | 1.955 |
| HCM Lane V/C Ratio | 0.053 | 0.048 | 0.01 |
| HCM Control Delay | 7.4 | 6.8 | 7 |
| HCM Lane LOS | A | A | A |
| HCM 95th-tile Q | 0.2 | 0.2 | 0 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1 | 4 | 1 | 3 | 10 | 1 |
| Future Volume (Veh/h) | 1 | 4 | 1 | 3 | 10 | 1 |
| Sign Control | Free | | | Free | Yield | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 |
| Hourly flow rate (vph) | 2 | 8 | 2 | 6 | 21 | 2 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 10 | | 16 | 6 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 10 | | 16 | 6 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 98 | 100 |
| cM capacity (veh/h) | | | 1610 | | 1001 | 1077 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 10 | 8 | 23 |
| Volume Left | 0 | 2 | 21 |
| Volume Right | 8 | 0 | 2 |
| cSH | 1700 | 1610 | 1007 |
| Volume to Capacity | 0.01 | 0.00 | 0.02 |
| Queue Length 95th (ft) | 0 | 0 | 2 |
| Control Delay (s) | 0.0 | 1.8 | 8.7 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 1.8 | 8.7 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.2 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

Harbor Redevelopment
1: 2nd St & Bridge St

Build (2025) Conditions
Timing Plan: Sat Peak Hour

| Intersection | | | | | | |
|---|---|---|---|---|---|---|
| Int Delay, s/veh | 351 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 286 | 130 | 360 | 1 | 5 | 274 |
| Future Vol, veh/h | 286 | 130 | 360 | 1 | 5 | 274 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 50 | 50 | 50 | 50 | 50 | 50 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 572 | 260 | 720 | 2 | 10 | 548 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1015 | 361 | 0 | 0 | 722 | 0 |
| Stage 1 | 721 | - | - | - | - | - |
| Stage 2 | 294 | - | - | - | - | - |
| Critical Hdwy | 6.84 | 6.94 | - | - | 4.14 | - |
| Critical Hdwy Stg 1 | 5.84 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.84 | - | - | - | - | - |
| Follow-up Hdwy | 3.52 | 3.32 | - | - | 2.22 | - |
| Pot Cap-1 Maneuver | ~ 234 | 636 | - | - | 876 | - |
| Stage 1 | ~ 443 | - | - | - | - | - |
| Stage 2 | 730 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | ~ 230 | 636 | - | - | 876 | - |
| Mov Cap-2 Maneuver | ~ 230 | - | - | - | - | - |
| Stage 1 | ~ 443 | - | - | - | - | - |
| Stage 2 | 718 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | $ 890.8 | 0 | 0.3 |
| HCM LOS | F | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 287 | 876 | - |
| HCM Lane V/C Ratio | - | - | 2.899 | 0.011 | - |
| HCM Control Delay (s) | - | - | $ 890.8 | 9.2 | 0.1 |
| HCM Lane LOS | - | - | F | A | A |
| HCM 95th %tile Q(veh) | - | - | 72.4 | 0 | - |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 286 | 130 | 360 | 1 | 5 | 274 |
| Future Volume (vph) | 286 | 130 | 360 | 1 | 5 | 274 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.0 | | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | | 0.95 |
| Frt | 0.96 | | 1.00 | | | 1.00 |
| Flt Protected | 0.97 | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1725 | | 3538 | | | 3536 |
| Flt Permitted | 0.97 | | 1.00 | | | 0.93 |
| Satd. Flow (perm) | 1725 | | 3538 | | | 3308 |
| Peak-hour factor, PHF | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| Adj. Flow (vph) | 572 | 260 | 720 | 2 | 10 | 548 |
| RTOR Reduction (vph) | 17 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 815 | 0 | 722 | 0 | 0 | 558 |
| Turn Type | Prot | | NA | | Perm | NA |
| Protected Phases | 3 | | 2 | | | 2 |
| Permitted Phases | | | | | 2 | |
| Actuated Green, G (s) | 29.3 | | 16.4 | | | 16.4 |
| Effective Green, g (s) | 29.3 | | 16.4 | | | 16.4 |
| Actuated g/C Ratio | 0.51 | | 0.28 | | | 0.28 |
| Clearance Time (s) | 6.0 | | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 875 | | 1005 | | | 940 |
| v/s Ratio Prot | c0.47 | | c0.20 | | | |
| v/s Ratio Perm | | | | | | 0.17 |
| v/c Ratio | 0.93 | | 0.72 | | | 0.59 |
| Uniform Delay, d1 | 13.3 | | 18.6 | | | 17.8 |
| Progression Factor | 1.00 | | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 16.2 | | 2.5 | | | 1.0 |
| Delay (s) | 29.5 | | 21.1 | | | 18.8 |
| Level of Service | C | | C | | | B |
| Approach Delay (s) | 29.5 | | 21.1 | | | 18.8 |
| Approach LOS | C | | C | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 23.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.85 | | |
| Actuated Cycle Length (s) | 57.7 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 44.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

Harbor Redevelopment
1: 2nd St & Bridge St

Build (2025) Conditions - Officer Control
Timing Plan: Sat Peak Hour

| Lane Group | WBL | NBT | SBT |
|---|---|---|---|
| Lane Group Flow (vph) | 832 | 722 | 558 |
| v/c Ratio | 0.93 | 0.72 | 0.59 |
| Control Delay | 33.2 | 23.7 | 21.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 33.2 | 23.7 | 21.3 |
| Queue Length 50th (ft) | 243 | 122 | 91 |
| Queue Length 95th (ft) | 136 | 84 | 66 |
| Internal Link Dist (ft) | 441 | 435 | 437 |
| Turn Bay Length (ft) | | | |
| Base Capacity (vph) | 948 | 1048 | 980 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.88 | 0.69 | 0.57 |

Intersection Summary

| Intersection | |
|---|---|
| Int Delay, s/veh | 29.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 1 | 59 | 14 | 3 | 55 | 2 | 15 | 5 | 12 | 117 | 102 | 115 |
| Future Vol, veh/h | 1 | 59 | 14 | 3 | 55 | 2 | 15 | 5 | 12 | 117 | 102 | 115 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 2 | 118 | 28 | 6 | 110 | 4 | 30 | 10 | 24 | 234 | 204 | 230 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 114 | 0 | 0 | 146 | 0 | 0 | 477 | 262 | 132 | 277 | 274 | 112 |
| Stage 1 | - | - | - | - | - | - | 136 | 136 | - | 124 | 124 | - |
| Stage 2 | - | - | - | - | - | - | 341 | 126 | - | 153 | 150 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1475 | - | - | 1436 | - | - | 498 | 643 | 917 | 675 | 633 | 941 |
| Stage 1 | - | - | - | - | - | - | 867 | 784 | - | 880 | 793 | - |
| Stage 2 | - | - | - | - | - | - | 674 | 792 | - | 849 | 773 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1475 | - | - | 1436 | - | - | 281 | 640 | 917 | 647 | 630 | 941 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 281 | 640 | - | 647 | 630 | - |
| Stage 1 | - | - | - | - | - | - | 866 | 783 | - | 879 | 790 | - |
| Stage 2 | - | - | - | - | - | - | 376 | 789 | - | 815 | 772 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.1 | 0.4 | 14.8 | 42.8 |
| HCM LOS | | | B | E |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 431 | 1475 | - | - | 1436 | - | - | 718 |
| HCM Lane V/C Ratio | 0.148 | 0.001 | - | - | 0.004 | - | - | 0.93 |
| HCM Control Delay (s) | 14.8 | 7.4 | 0 | - | 7.5 | 0 | - | 42.8 |
| HCM Lane LOS | B | A | A | - | A | A | - | E |
| HCM 95th %tile Q(veh) | 0.5 | 0 | - | - | 0 | - | - | 13 |

Harbor Redevelopment
3: 3rd St & River St

Build (2025) Conditions
Timing Plan: Sat Peak Hour

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 13.9 |
| Intersection LOS | B |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 4 | 81 | 21 | 6 | 272 | 1 |
| Future Vol, veh/h | 4 | 81 | 21 | 6 | 272 | 1 |
| Peak Hour Factor | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 8 | 162 | 42 | 12 | 544 | 2 |
| Number of Lanes | 1 | 0 | 0 | 1 | 1 | 0 |

| Approach | EB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 1 | 1 |
| Conflicting Approach Left | SB | EB | |
| Conflicting Lanes Left | 1 | 1 | 0 |
| Conflicting Approach Right | NB | | EB |
| Conflicting Lanes Right | 1 | 0 | 1 |
| HCM Control Delay | 9.2 | 8.6 | 15.9 |
| HCM LOS | A | A | C |

| Lane | NBLn1 | EBLn1 | SBLn1 |
|---|---|---|---|
| Vol Left, % | 78% | 5% | 0% |
| Vol Thru, % | 22% | 0% | 100% |
| Vol Right, % | 0% | 95% | 0% |
| Sign Control | Stop | Stop | Stop |
| Traffic Vol by Lane | 27 | 85 | 273 |
| LT Vol | 21 | 4 | 0 |
| Through Vol | 6 | 0 | 272 |
| RT Vol | 0 | 81 | 1 |
| Lane Flow Rate | 54 | 170 | 546 |
| Geometry Grp | 1 | 1 | 1 |
| Degree of Util (X) | 0.076 | 0.224 | 0.668 |
| Departure Headway (Hd) | 5.096 | 4.74 | 4.407 |
| Convergence, Y/N | Yes | Yes | Yes |
| Cap | 699 | 755 | 819 |
| Service Time | 3.153 | 2.784 | 2.444 |
| HCM Lane V/C Ratio | 0.077 | 0.225 | 0.667 |
| HCM Control Delay | 8.6 | 9.2 | 15.9 |
| HCM Lane LOS | A | A | C |
| HCM 95th-tile Q | 0.2 | 0.9 | 5.2 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1 | 272 | 1 | 3 | 10 | 1 |
| Future Volume (Veh/h) | 1 | 272 | 1 | 3 | 10 | 1 |
| Sign Control | Free | | | Free | Yield | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| Hourly flow rate (vph) | 2 | 544 | 2 | 6 | 20 | 2 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 546 | | 284 | 274 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 546 | | 284 | 274 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 97 | 100 |
| cM capacity (veh/h) | | | 1023 | | 705 | 765 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 546 | 8 | 22 |
| Volume Left | 0 | 2 | 20 |
| Volume Right | 544 | 0 | 2 |
| cSH | 1700 | 1023 | 710 |
| Volume to Capacity | 0.32 | 0.00 | 0.03 |
| Queue Length 95th (ft) | 0 | 0 | 2 |
| Control Delay (s) | 0.0 | 2.1 | 10.2 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 2.1 | 10.2 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.4 | | |
| Intersection Capacity Utilization | 26.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |